STATE OF MICHIGAN

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

This contract authorizes the professional services contractor to provide professional services.
(Authority: 1984 PA 431)

CONTRACT FOR PROFESSIONAL SERVICES: Indefinite Scope-Indefinite Delivery

THIS CONTRACT authorized this 30th day of June in the year two-thousand and twenty-three (2023), by the Director, Department of Technology, Management and Budget, BETWEEN the STATE OF MICHIGAN acting through the STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION of the DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET, 3111 W. St. Joseph Street, Lansing, Michigan 48917, hereinafter called the Department, and

Fishbeck
1515 Arboretum Drive, SE
Grand Rapids, MI 49546

the Prime Professional Services Contractor, hereinafter called the Professional.

WHEREAS, the Department proposes securing professional services for:

Indefinite-Scope, Indefinite-Delivery Contract No. 01010
Index No. (To Be Established) Contract Order No. Y (To Be Assigned)
File No. (To Be Assigned)

Department of Technology, Management and Budget, State Facilities Administration, Design and Construction Division, Professional Architectural and Engineering Indefinite-Scope, Indefinite-Delivery Contract (ISID) for Minor Projects – **2023 Expanded Environmental Remediation ISID Services**

Various State Departments and Facilities
Various Site Locations, Michigan

NOW THEREFORE, the Department and the Professional in consideration of the covenants of this Contract agree as follows:

I. The Professional shall provide primary environmental investigation/assessment services for the Project in the Study Phase to the extent authorized by the Department of Technology, Management and Budget State Facilities Administration (SFA), Design and Construction Division (DCD) [The Department] and be solely responsible for such professional services. The Professional's services shall be performed in strict accordance with the Project.

II. If authorized, the Professional shall provide environmental services for the identified project types.

PROJECT TYPES AND SERVICES OFFERED											
Excavation, Dewatering and Off-Site Disposal	Demolition	Migration Control, Fluid Removal and Containment	Landfills	Indoor Air / Vapor Intrusion	In-Situ Physical / Chemical	In-Situ Physical / Biological	Ex-Situ Physical / Chemical	Ex-Situ Physical / Biological	In-Situ and Ex-Situ Thermal	PFAs	Alternative Technologies
X	X	X	X	X	X	X	X	X		X	X

III. The State of Michigan shall compensate the Professional for providing their professional services for the Project in accordance with the conditions of this Professional Services Contract.

IN WITNESS, WHEREOF, each of the parties has caused this Professional Services Contract to be executed by its duly authorized representatives on the dates shown beside their respective signatures, with the Contract to be effective upon the date on which the Professional received a copy executed by the authorized State of Michigan representative(s) by regular, registered, or certified mail or by delivery in person.

FOR THE PROFESSIONAL:

Fishbeck
Firm Name

CV0021627
SIGMA Vendor Number

Signature

July 11, 2023
Date

Vice President/Treasurer
Title

FOR THE STATE OF MICHIGAN:

Director, Department of Technology, Management and Budget

July 17, 2023
Date

WHEREAS this Professional Services Contract constitutes the entire agreement as to the Project between the parties, any Contract Modification of this Contract and the Department's approved and attached Project/Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to compensate the Professional for correcting, or for responding to claims or litigation for, the Professional firm's final design Contract Documents/architectural and engineering design errors, omissions, or neglect on the part of the Professional.

ARTICLE I
PROFESSIONAL SERVICES SCOPE OF WORK

Provide professional environmental services, technical staff, and support personnel for ISID minor projects on an as-needed basis at various State/Client Agencies within the various site location areas as defined by the State of Michigan.

This Contract is for professional environmental investigation and/or design services for an unspecified number of ISID projects ("Assignment"). The scope of work for each assigned project will be defined at the time the project is awarded by the State to the Professional firm. The professional environmental services required for each of these assigned projects requested by the Department may include any or all of the Tasks included in the Phase 100 – Study through the Phase 900 – Operation and Maintenance Management.

The Professional firm's environmental services shall be performed in strict accordance with this Professional Services Contract and be in compliance with the Department's approved and attached Appendix I– Project/Program Statement.

This Contract does not warrant or imply to the Professional environmental firm, entitlement to perform any specific percentage (%) amount of environmental work during the life of this Contract.

This Contract will remain in effect for three (3) years from the date of this Contract award but may be unilaterally terminated by the State of Michigan at any time, for cause or its convenience, by written notification of the State, to the Professional. Furthermore, this Contract may be extended for two (2) additional years, at the sole option and discretion of the State upon the Department providing written notice to the Professional prior to the expiration of the original Contract period. Any such time extension shall be subject to the terms and conditions of this Contract, including, but not limited to, the existing hourly billing rates included in this Contract for the Professional, their Consultant, and their employees or agents.

Please note that the Professional Services Contract ISID Contract No., as noted on page 1, must be provided on all Project correspondence and documents. Also, services are not to be provided or expenses incurred until individual ISID Projects are assigned to this Contract (see the Article II – Compensation and the Appendix 1 – Project / Program Statement).

Upon award of this Contract and each subsequent assignment, the Professional understands and agrees that time is of the essence. Failure to adhere to timely completion will be grounds for the Department, at its sole discretion, to terminate or limit future work under this Contract.

The Professional shall provide all professional services, technical staff, and support personnel necessary to complete the Project as described in its Project/Program Statement, in the best interest of the State, and within the Professional's fee(s) herein authorized by the State.

Assigned project services shall comprise, without exception, every professional discipline and expertise necessary to meet all the requirements as described in the Project / Program Statement and in accordance with the accepted industry standards for professional practice and services. The Professional's services include attendance at all Project related meetings and conferences. Professional services for the assigned projects under this contract shall be provided in the Phase / Task sequence shown below and shall be rendered in accordance with the Professional's proposed and approved Project Study, Design, and Proposed Construction Schedule.

The Professional's study, design, and proposed construction schedule shall be detailed, undated, and time sequence related for all Phase / Task services appropriate for the Project. The Professional shall field-check and verify the accuracy of all study/drawing and any data furnished by the Department, the State / Client Agency or any other Project related source.

The Professional shall not employ or consult with any firms in completing the Professional's obligations herein who it anticipates will be a construction Bidder for the Project or any part thereof, unless specifically authorized, in writing, by the Department. The Professional acknowledges that the Department is the first interpreter of the Professional's performance under this Contract.

The Professional acknowledges by signing this Professional Services Contract having a clear understanding of the requested professional environmental services required by the Department, and further agrees that the terms and conditions of this Professional Services Contract provide adequate professional fee(s) for the Professional to provide the requested Project scope of work requirements for each assigned project. No increase in compensation to the Professional will be allowed unless there is a material change made to the scope of work of the Assignment/Program Statement and the change is accepted and approved, in writing, by the State. Professional services shall not be performed, and no Project expenses shall be incurred by the Professional prior to the issuance of a written and signed Professional Services Contract and a Contract Order authorizing the Professional to start the Project work. Compensation for Department directed changes to the Project will be provided to the Professional by a Contract Modification and / or Contract Change Order signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Project Director / Agency Project Manager, on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and half percent (7.5%) of the Construction Contractor's quotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director / Agency Project Manager.

The Professional shall immediately inform the Department whenever it is indicated that the Professional's authorized not-to-exceed Budget for any of the assigned Projects may be exceeded. The Professional shall make recommendations to the Department for revisions to be implemented in order to not exceed the original authorized Budget. Any revision to the Project must be accepted and approved by the Department in writing.

The professional services may also include participation in legislative presentations as described in the "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" and as the legislature or the Department may prescribe.

No substitution of any "Key Personnel/Employee" essential for the successful completion of the Project and identified in the Professional's Organizational Chart will be allowed by the Professional for this Contract without the prior written consent from the Project Director / Agency Project Manager.

Before any “Key Personnel/Employee” substitution takes place, the Professional shall submit a written request to the Project Director / Agency Project Manager, and this substitution request shall include the following information: (1) A request in writing for a No Cost Contract Modification; (2) Detailed written justification for this substitution; (3) The Professional’s qualifications of any proposed “Key Principal Personnel/Employee” replacement; and (4) A written statement from the Professional assuring the Department that the Project scope of work will not be adversely affected by this substitution. This request to modify their Professional Services Contract must be accepted and approved in writing by the Project Director / Agency Project Manager and the Director of the Department.

The Department will designate individuals to serve as the Project Director and Agency Project Manager for the Project scope of work who shall be fully acquainted with the Project / Program Statement and have the authority to render Project decisions and furnish information promptly. Except in connection with issues under the Article XII - Contract Claims and Disputes text, the Project Director / Agency Project Manager will exercise general management and administration for the Professional’s services in so far as they affect the interest of the State. The Professional shall indemnify, defend, and hold harmless the State against exposure to claims arising from delays, negligence, or delinquencies by the Professional for the professional services of this Contract.

During the Construction Administration Services Phase of the Project, the Professional is required to complete and submit, the on-site inspection record form, “DTMB-0452, The Professional’s Inspection Record,” for all on-site inspection visits to the Project site. The Inspection Record shall be completed and signed by the Professional and submitted monthly, with the original document sent to the Project Director / Agency Project Manager and copies sent to the Construction Contractor. The Inspection Record shall accompany the Professional’s monthly payment request.

The “DTMB-0460, Project Procedures” contains Department forms which shall be used during the Construction Administration Phase of this Contract.

All professional services will be consistent with the Department’s current "Major Project Design Manual for Professional Services Contractors and State / Client Agencies" unless otherwise approved in writing by the Department.

The professional services required for each Phase of this Contract shall be performed by the Prime Professional and their Consultants in accordance with service descriptions in this article.

The following service descriptions outlined in this Contract represent the Department’s standard of care for the Professional’s responsibilities for providing the professional services of this Contract; but by inclusion, or omission, the descriptions do not limit or exclude any regular or normal professional services necessary to accomplish the Project in accordance with the approved Project Budget and the industries accepted practice and standards for professional services. All the services outlined in this Contract may not be applicable to the Project / Program Statement. The Professional shall determine and coordinate the interface of the services required for the Project and is responsible for identifying any additional services necessary to successfully complete the Project.

The professional shall execute the following PHASES upon written authorization from the Project Director.

PHASE 100 - ENVIRONMENTAL INVESTIGATION/STUDY SERVICES

Provide complete and comprehensive Environmental Investigation / Study Deliverables to meet the requirements of the Project / Program Statement. Upon completion of all field investigation, assessment, research, review and / or oversight, prepare a complete report with an executive summary, and in such detail, as the Project Director may prescribe.

The services under this phase may include but not be limited to coordination, environmental assessments, drilling, field sampling/oversight, data/document review/management, feasibility study, and reporting as described in the Project/Program Statement. Project reports must be in accordance with Department / Client / Agency requirements and as outlined in the Project/Program Statement but shall include, as a minimum and as appropriate, the following items: (1) Problem; (2) Conclusion; (3) Recommendations; and (4) Discussion, details, and documentation.

PHASE 300 - SCHEMATIC DESIGN

Prepare Schematic Design Deliverables consistent with the Project/Program Statement. The deliverables shall consist of conceptual remediation system, drawings, outline specifications, a Schematic Construction Cost Estimate, other related documentation, and shall diagrammatically depict the areas, scales, and relationships of the functions. The services under this phase may include but not be limited to coordination, construction codes and design reviews, civil/site staging investigation, schematic design, and utilities review, drafting, and project cost / proposed construction schedule, as required by the Department / Client / Agency and as outlined in the Project/Program Statement. Acceptance of the Schematic Design by the Department / Client / Agency does not limit subsequent inclusion of minor, but essential, schematic or design details whose necessity and arrangement may best become apparent during subsequent Phases of the Project design. Revise design as necessary and obtain approval from the Department/Client / Agency.

PHASE 400 - DESIGN DEVELOPMENT

Prepare Design Development Deliverables based on the Owner-accepted Schematic Design to depict the intent of the designed remediation system(s). The deliverables shall consist of draft drawings and specifications, Construction Cost Estimates, and other related documentation to clearly establish the complete basis for further detail into final design drawings / specifications. The deliverables shall further define the Project by fixing and describing the Project size, character, site relationships, and other appropriate elements including the environmental, civil, structural, architectural, mechanical, electrical, and safety systems. The services under this phase may include but not be limited to coordination, draft drawings/specifications, site specific staging investigation, structural calculations, and preliminary environmental/architectural/engineering design development / reviews of drawings / specifications, as required by the Department / Client / Agency and as outlined in the Project / Program Statement.

PHASE 500 - CONSTRUCTION DOCUMENTS AND BIDDING DOCUMENTS

Prepare construction documents that revise, refine, amplify, and depict, in detail, the project. The documents shall set forth, in detail, quality levels of and requirements for the construction, and shall consist of final drawings / specifications that comply with applicable regulatory and construction code requirements, enacted at the time of completion of the one hundred percent (100%) construction documents. Prepare bidding documents in Phases / Bid Packages appropriate to the project requirements and funding. Incorporate the current edition of the DTMB “MICHSPEC”, “DCSPEC” or “50KSPEC”, as adopted and modified by the State of Michigan. The construction documents shall contain all information necessary to bid and construct the project.

The services under this phase may include but not be limited to coordination, final drawings / specifications and bidding documents, civil / site staging design, final structural calculations, final environmental / architectural / engineering design development / reviews of drawings / specifications, construction testing program, hazardous materials, health and safety risks, final design correction procedures, design and construction budget, construction codes / permits and construction schedule, as required by the Department / Client / Agency and as outlined in the Project / Program Statement.

PHASE 600 - CONSTRUCTION ADMINISTRATION - OFFICE SERVICES

Provide all required construction oversight administration and timely professional review and administrative services, as the circumstances of the construction may require, allowing the successful review / implementation of the construction documents into a completed remedial actions / abatement measures and / or for the use intended by the Department / Client / Agency. The services under this phase may include but not be limited to coordination, review and approval of shop drawings and submittals, reporting of construction progress, construction quality testing, construction contractor performance review, punch list procedures, claims, establishing close-out procedures and developing / review of as-built documents, as required by the Department / Client / Agency requirements, and as outlined in the Project / Program Statement.

PHASE 700 - CONSTRUCTION ADMINISTRATION - FIELD SERVICES

Provide all required Construction Oversight and Field Services, including timely inspection and professional services, as the circumstances of the construction may require, allowing the successful review / implementation of the construction documents into a completed remedial action / abatement measure and / or for the use intended by the Department / Client / Agency. The services under this phase may include but not be limited to coordination, field inspections, progress meetings and final project inspection, as required by the Department / Client / Agency requirements and as outlined in the Project / Program Statement.

PHASE 900 – OPERATION AND MAINTENANCE SERVICES – REMEDIATION FACILITY

Provide all required Operation and Maintenance (O & M) Services and perform, in a safe and secure environment, all functions, including timely inspection, sampling and professional services, necessary to maintain uninterrupted, effective, and efficient facility / system components for the use intended by the Department / Client / Agency. The services under this phase may include but not be limited to coordination, general system operation / inspections, routine system / building / ground maintenance, sampling, spare replacement parts, consumable supplies, utilities, waste materials removal / treatment / disposal, non-routine emergency services, progress meetings and reporting, as required by the Department / Client / Agency requirements and as outlined in the Project / Program Statement.

ARTICLE II
COMPENSATION

In consideration of the performance of this Contract, the Department agrees to pay the Professional, as compensation for professional services, an hourly billing rate for each employee providing a direct service to this project, on a not-to-exceed basis as specified herein, subject to subsequent modifications mutually agreeable to the parties hereto; provided, however, the Professional may not incur costs, or bill the Department, for professional services in excess of the estimates established for this Project without the prior written agreement of the Department.

The attached proposal prepared by the Professional in response to the Request for Proposal, by the Owner, may describe methodology, services, schedule, and other aspects of the work to be performed under the Contract but does not supersede the Contract.

Compensation to the Professional shall be on an hourly billing rate basis for professional services rendered by salaried and non-salaried professional, technical, and technical support employees, except for any authorized reimbursable expenses provided for in this Contract.
Total compensation for any Phase shall not exceed the amount authorized for that Phase, unless authorized in writing by the Department’s approved Contract Change Order.

Professional services shall not be performed, and no project expense shall be incurred by the Professional firm prior to the issuance of a written and signed Professional Services Contract and a DTMB-0402 - Contract Order by the Department to the Professional, authorizing the Professional to start the Project.

Compensation to the Professional for services and authorized technical and technical support employees performing a direct service for this project shall be determined using the Professional firm's billing rates. The Professional firm's hourly billing rate shall be the actual amount paid for the employee services on the project including fringe benefits, vacations, sick leave, other indirect costs, and profit. The Professional firm's hourly billing rates shall not change during the life of this contract without written approval by the Department.

See attached Appendix**, Overhead Items Allowed for the Professional Services Contractor Firm's Hourly Billing Rate Calculation**, for the guide to overhead items allowed for the professional services contractor firm's hourly billing rate calculation. Reimbursement for the Project / Program Statement scope of work requirements will be provided only for Department approved items authorized for reimbursement compensation in this Contract. The State will not reimburse the Professional for downtime, or for personnel involved in downtime due to mechanical problems or failure of Professional's or Subcontractor's equipment.

The preparation of Bulletins and Contract Change Orders resulting from changes to the project scope of work or previously unknown on-site field conditions will be compensated to the Professional, as approved by the Department on an hourly billing rate basis in accordance with this article. This compensation shall not exceed seven and one-half percent (7.5%) of the Construction Contractor's quotation for the Bulletin or Contract Change Order or an amount mutually agreed upon by the Professional and the Project Director / Agency Project Manager.

The Professional shall provide, but no additional monetary compensation shall be allowed for the services necessary to respond to and resolve all claims arising wholly or in part from the Professional's errors and / or omissions or other aspects of the Project's design or the Professional firm's performance which is inconsistent with the Professional or Construction Contract.

2.1 PREMIUM TIME/OVERTIME: This Contract anticipates that no premium or overtime is required to achieve the Project's scope of work. No compensation will be allowed to the Professional for any premium or overtime cost incurred to achieve the Project schedule of this Contract, unless directed in writing by the Project Director / Agency Project Manager and approved by the Department.

2.2 EMPLOYEE HOURLY BILLING RATES: Hourly billing rates will include all direct and indirect monetary costs to the State for the Professional's services under this Contract other than the authorized and approved reimbursements. Hourly billing rates shall be based on the Professional's documented historical operating expenses and adjusted for Project specific costs. In no case shall this documentation period include more than eighteen (18) months prior to the date of award of this Contract.

Lump-sum payments to employees are not allowed under this Contract. Billing rates for employees who perform professional services of a subordinate or of a position classification having a lower classification / pay range shall be accounted and paid for at the lower hourly billing pay rate. The hourly billing rate charge of any employee may be changed by the Professional with a written and Department approved Contract Modification to account for normal personnel pay increases.

Hourly billing rates include, but are not limited to: Overhead items such as employee fringe benefits, vacations, sick leave, insurance, taxes, pension funds, retirement plans, meals, lodging, and all Project related travel expenses for Projects **less than** one-hundred (100) miles in each direction from the Professional's Michigan office, computer costs/operating costs, data entry, and time, telephone, telephone-related services, and all reproduction services (except Contract Bidding Documents/Deliverables).

The hourly billing rate also includes all reproduction costs for design interpretations, study/design clarifications and Bulletins related to design errors or omissions, construction code compliance (precipitating either from design code compliance and plan review, design interpretations, or construction on-site/field inspections), and all similar, or avoidable costs. All incidental postage, mail, or other shipping or delivery services, acquisition, bad debts, previous business losses, employment fees, depreciation, and operating costs for equipment, including computer design and/or computer drafting systems, and any specialized testing equipment are to be included. The hourly billing rate shall include, without exception, secretarial, computer / typing / word processing, editing, and clerical services utilized in any way for the Project as well as other non-technical and/or employees providing indirect services. The hourly billing rate also includes all profit without regard to its form or distribution.

Items not allowable as part of the Professional's calculated hourly billing rate include but are not limited to: Any costs associated with litigation and settlements for the Professional, other liability suits, out-of-state offices and associated travel, bonuses, profit sharing, premium/overtime costs, public relations, entertainment, business promotion, contributions, and various speculative allowances.

The hourly billing rate for the Professional may not be applied to the work of the Professional's Sub-Consultant's staff. Each Sub-Consultant firm must submit a separate hourly billing rate with proper documentation for Sub-Consultant services provided as part of the Proposal. The hourly billing rate of the respective Consultant firm shall be used for that Consultant firm's personnel only. No mark-up to Consultant firm's charges will be allowed.

2.3 RANGE OF EMPLOYEE HOURLY BILLING RATES: The Professional shall identify the service being provided and include the Professional's or Consultant's employee(s) full names and position classifications for the Project and their current hourly billing rates at the beginning and at the anticipated end of the Project. This hourly billing rate range shall reflect any anticipated pay increases over the life of the Contract. The range of hourly billing rates for any employee position or classification may not be changed without an approved Contract Modification.

2.4 DIRECT COST REIMBURSEMENT ITEMS: The Professional's Consultant services and authorized reimbursable expenses shall be treated as an authorized reimbursable expense item at a direct cost. The Professional shall be responsible for the selection of the supplier of the professional services or materials; the coordination, adequacy, and application of the professional services, whether provided by the Professional's staff or provided by their Consultant, and any Project costs that exceed the budget for each Phase.

Project related travel expenses (mileage, meals, lodging) for Projects **more than** one hundred (100) miles in one-way from the Professional's nearest office shall be treated as an authorized reimbursable expense at the State of Michigan's current travel rates.

Unless authorized elsewhere in this Contract, direct cost reimbursement items shall be limited to the actual cost of printing and reproduction of project deliverables such as Final Study Reports, Surveys, Bidding Documents, and U.S. Mail regular shipping postage of the project deliverables listed above.

In addition, direct cost reimbursement items may include soil borings, site surveys and any required laboratory testing, Design Code Compliance and Plan Review Approval Fees by the licensing agency; reproduction of documents for legislative presentation, artistic productions, mobilization of testing equipment, laboratory costs for testing samples, per-linear-foot cost of soil borings and specialized inspections of the structural, mechanical, electrical, chemical or other essential components of the Project.

Compensation for this Contract shall not exceed the budget per Project Phase identified in the attached Contract Order unless authorized by a Department approved Contract Modification. It shall be the Professional's responsibility to carefully monitor Project costs, activities, and progress and to provide the Project Director / Agency Project Manager timely notification of any justifiable need to increase the authorized budget. The Professional may not proceed with professional services that have not been authorized by the Project Director / Agency Project Manager and shall immediately notify the Project Director / Agency Project Manager if such services have been requested or have become necessary.

Professional / Sub-Consultant staff and hourly billable rates are identified in the attached Professional's proposal.

ARTICLE III
PAYMENTS

Payment for the professional services shall be based on the Professional's performance of authorized professional service(s) performed prior to the date of each submitted payment request. Payment requests shall be submitted monthly to the Project Director / Agency Project Manager on a payment request form (DTMB-0440). Payment for each monthly submitted payment request shall be made within thirty (30) consecutive calendar days following the Department's approval of the payment request. Payment requests shall include signed certification by the Professional of the actual percentage of work completed as of the date of invoicing for each Phase and summarize the amounts authorized, earned, previously paid, and currently due for each Project Phase. Payment requests shall be supported by itemized records or documentation in such form and detail as the Department may require. Each of the Professional's Consultant's submitted payment request applications shall include similar information. This includes, but is not limited to:

a) Phase Numbers for the professional services provided.

b) Professional's personnel and position/classification providing service and hours worked

c) Current hourly billing rate charges for each individual position/classification.

d) Copy of certified on-site visitation log or site visit report showing time on-site.

e) Itemized invoices from each of the Professional's Consultant's documenting that firm's professional services charge and the Project work related services provided.

f) Authorized reimbursable expense items provided with receipts and invoices.

The State has the right to withhold payment of any disputed amounts until the parties agree as to the validity of the disputed amount. The State will notify the Professional of any dispute within a reasonable time. Payment by the State will not constitute a waiver of any rights as to the Professional's continuing obligations, including claims for deficiencies or substandard Contract Activities.

The Professional's acceptance of final payment by the State constitutes a waiver of all claims by the Professional against the State for payment under this Contract, other than those claims previously filed in writing on a timely basis and still disputed.

The State will only disburse payments under the Contract through Electronic Funds Transfer (EFT). Contractor must register with the State at http://www.michigan.gov/SIGMAVSS to receive electronic funds transfer payments. If Contractor does not register, the State is not liable for failure to provide payment. Without prejudice to any other right or remedy if may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract.

ARTICLE IV
ACCOUNTING

The Professional shall keep current and accurate records of Project costs and expenses, hourly billing rates, authorized reimbursable expense items, and all other Project related accounting documents to support the Professional's monthly application for payment. Project records shall be kept on a generally recognized accounting basis. Such records shall be available to the Department for a period of ten (10) years after the Department's final payment to the Professional. The State of Michigan reserves the right to conduct, or have conducted, an audit and inspection of these Project records at any time during the Project or following its completion.

ARTICLE V
INSURANCE

The Professional shall purchase, maintain, and require such insurance that will provide protection from claims set forth below which may arise out of or result from the Professional firm's services under this Contract, whether such service is performed by the Professional or performed by any of the Professional firm's Consultant's or by anyone directly or indirectly employed by them, or by anyone for whose acts they may be liable. The following insurance policy limits described below are intended to be the minimum coverage acceptable by the State:

For the purpose of this Section, "State" includes its departments, divisions, agencies, offices, commissions, officers, employees, and agents.

(a) The Contractor must provide proof that it has obtained the minimum levels of insurance coverage indicated or required by law, whichever is greater.

The insurance must protect the State from claims that may arise out of or result from or are alleged to arise out of or result from the Contractor's or a Subcontractor's performance, including any person directly or indirectly employed by the Contractor or a Subcontractor, or any person for whose acts the Contractor or a Subcontractor may be liable.

(b) The Contractor waives all rights against the State for the recovery of damages that are covered by the insurance policies the Contractor is required to maintain under this Section. The Contractor's failure to obtain and maintain the required insurance will not limit this waiver.

(c) All insurance coverage provided relative to this Contract is primary and non-contributing to any comparable liability insurance (including self-insurance) carried by the State.

(d) The State, in its sole discretion, may approve the use of a fully funded self-insurance program in place of any specified insurance identified in this Section.

(e) Unless the State approves, any insurer must have an A.M. Best rating of "A" or better and a financial size of VII or better, or if those ratings are not available, a comparable rating from an insurance rating agency approved by the State. All policies of insurance must be issued by companies that have been approved to do business in the State. To view the latest A.M. Best's Key Ratings Guide and the A.M. Best's Company Reports (which include the A.M. Best's Ratings) visit the A.M. Best Company internet web site at http://www.ambest.com.

(f) Where specific coverage limits are listed in this Section, they represent the minimum acceptable limits. If the Contractor's policy contains higher limits, the State is entitled to coverage to the extent of the higher limits.

(g) The Contractor must maintain all required insurance coverage throughout the term of this Contract and any extensions. However, in the case of claims-made Commercial General Liability policies, the Contractor must secure tail coverage for at least three (3) years following the termination of this Contract.

(h) The minimum limits of coverage specified are not intended and may not be construed; to limit any liability or indemnity of the Contractor to any indemnified party or other persons.

(i) The Contractor is responsible for the payment of all deductibles.

(j) If the Contractor fails to pay any premium for a required insurance policy, or if any insurer cancels or significantly reduces any required insurance without the State's approval, the State may, after giving the Contractor at least 30 days notice, pay the premium or procure similar insurance coverage from another company or companies. The State may deduct any part of the cost from any payment due the Contractor or require the Contractor to pay that cost upon demand.

(k) In the event the State approves the representation of the State by the insurer's attorney, the attorney may be required to be designated as a Special Assistant Attorney General by the Michigan Attorney General.

Required Limits	Additional Requirements
Commercial General Liability Insurance	
Minimum Limits: $1,000,000 Each Occurrence Limit $1,000,000 Personal & Advertising Injury Limit $2,000,000 General Aggregate Limit $2,000,000 Products/Completed Operations	Professional must have their policy endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds using endorsement CG 20 10 11 85, or both CG 20 10 12 19 and CG 20 37 12 19.
Umbrella or Excess Liability Insurance	
Minimum Limits: $2,000,000 General Aggregate	Professional must have their policy follow form.
Automobile Liability Insurance	
Minimum Limits: $1,000,000 Per Accident	Professional must have their policy: (1) endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds; and (2) include Hired and Non-Owned Automobile coverage.
Workers' Compensation Insurance	
Minimum Limits: Coverage according to applicable laws governing work activities.	Waiver of subrogation, except where waiver is prohibited by law.
Employers Liability Insurance	
Minimum Limits: $500,000 Each Accident $500,000 Each Employee by Disease $500,000 Aggregate Disease.	
Professional Liability (Errors and Omissions) Insurance	
Minimum Limits: $1,000,000 Each Occurrence $2,000,000 Annual Aggregate Deductible Maximum: $50,000 Per Loss	

Required Limits	Additional Requirements
Commercial General Liability Insurance	
Minimum Limits: $1,000,000 Each Occurrence Limit $1,000,000 Personal & Advertising Injury Limit $2,000,000 General Aggregate Limit $2,000,000 Products/Completed Operations	Professional must have their policy endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds using endorsement CG 20 10 11 85, or both CG 20 10 12 19 and CG 20 37 12 19.
Umbrella or Excess Liability Insurance	
Minimum Limits: $2,000,000 General Aggregate	Professional must have their policy follow form.
Automobile Liability Insurance	
Minimum Limits: $1,000,000 Per Accident	Professional must have their policy: (1) endorsed to add "the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents" as additional insureds; and (2) include Hired and Non-Owned Automobile coverage.
Workers' Compensation Insurance	
Minimum Limits: Coverage according to applicable laws governing work activities.	Waiver of subrogation, except where waiver is prohibited by law.
Employers Liability Insurance	
Minimum Limits: $500,000 Each Accident $500,000 Each Employee by Disease $500,000 Aggregate Disease.	
Professional Liability (Errors and Omissions) Insurance	
Minimum Limits: $1,000,000 Each Occurrence $2,000,000 Annual Aggregate Deductible Maximum: $50,000 Per Loss	

Required Limits	Additional Requirements
Environmental and Pollution Liability (Errors and Omissions)	
Minimum Limits: $1,000,000 Each Occurrence $2,000,000 Annual Aggregate	Professional must have their policy: (1) be applicable to the work being performed, including completed operations equal to or exceeding statute of repose; (2) not have exclusions or limitations related to Transportation (upset overturn, spills during loading or unloading, Hazardous Materials Handling, and Non-Owned disposal site liability; and (3) endorsed to add "the State of Michigan, its departments, division, agencies, offices, commissions, officers, employees, and agents" as additional insured.

The Professional firm's Errors and Omissions coverage shall include coverage for claims resulting from acts of forbearance that cause or exacerbate pollution and claims of bodily injury and property damage in the amount of $1,000,000 minimum coverage per occurrence, $2,000,000 annual aggregate. This insurance is required of all Professional firms who conduct professional environmental services including, but not limited to, any of the following services:

(i) Remedial System Design.

(ii) Remediation Management.

(iii) Feasibility Development and Implementation.

(iv) Hydrogeological Evaluation.

(v) Media Testing and Analysis.

(vi) Subsurface and Geophysical Investigation.

(vii) Other related activities as determined by the Department.

Contractual Liability Insurance for claims for damages that may arise from the Professional's assumption of liability on behalf of the State under Article VI concerning indemnification for errors, omissions, or negligent acts in the course of the professional service or other provision within this Contract to the extent that such kinds of contractual liability are insurable in connection with and subject to limits of liability not less than for the general liability insurance and the professional liability insurance and set forth in subsections (c) and (d) above.

Except where the State has approved a subcontract with other insurance provisions, the Professional must require any Consultant / Subcontractor to purchase and maintain the insurance coverage required in this Article. Alternatively, the Contractor may include a Consultant / Subcontractor under the Professional's insurance on the coverage required in that Section.

The failure of a Consultant / Subcontractor to comply with insurance requirements does not limit the Professional's liability or responsibility.

Certificate of Insurance documents, acceptable to the State, shall be provided and filed with the Department prior to commencement of the Professional's Project services, unless otherwise approved in writing, and not less than 20 days before the insurance expiration date every year thereafter. Facsimile copies of the Certificate of Insurance **will not** be accepted. Certificate of Insurance documents must be either submitted hard copy or portable document file (.pdf). The Certificate of Insurance documents must specify on the certificate in the oblong rectangle space labeled "Description of Operations / Locations / Vehicles / Exclusions Added By Endorsement / Special Provisions / Special Items" the following items: **(1) The ISID Title; (2) The ISID Contract Number; and (3) The State of Michigan must be named as an "Additional Insured on the General Liability Insurance Policy."** The Certificate of Insurance documents shall contain a provision that the Project insurance coverage afforded under the insurance policies for this Contract will not be modified or canceled without at least thirty (30) consecutive calendar days prior written notice, except for 10 days for non-payment of premium, to the State of Michigan, Department.

The attached, Certificates of Insurance documents required for this Project shall be in force for this Project until the final payment by the State to the Professional is made and shall be written for not less than any

limits of liability specified above. The Professional has the responsibility for having their Consultant firms comply with these insurance requirements.

ARTICLE VI
INDEMNIFICATION

(a) To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from liability, including all claims and losses, and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties), accruing or resulting to any person, firm or corporation that may be injured or damaged by the Professional in the performance of this Contract and that are attributable to the negligence or tortious acts of the Professional or any of its Subcontractors / Consultants, or by anyone else for whose acts any of them may be liable.

(b) Employee Indemnification: In any and all claims against the State of Michigan, its departments, divisions, agencies, boards, sections, commissions, officers, employees and agents, by any employee of the Professional or any of its Subcontractors / Consultants, the indemnification obligation under this Contract shall not be limited in any way by the amount or type of damages, compensation or benefits payable by or for the Professional or any of its Subcontractors / Consultants under worker's disability compensation acts, disability benefit acts or other employee benefit acts. This indemnification clause is intended to be comprehensive. Any overlap in provisions, or the fact that greater specificity is provided as to some categories of risk, is not intended to limit the scope of indemnification under any other provisions.

(c) Patent/Copyright Infringement Indemnification: To the extent permitted by law, the Professional shall indemnify, defend and hold harmless the State from and against all losses, liabilities, damages (including taxes), and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest, and penalties) incurred in connection with any action or proceeding threatened or brought against the State to the extent that such action or proceeding is based on a claim that any piece of equipment, software, commodity or service supplied by the Professional or its Subcontractors / Consultants, or the operation of such equipment, software, commodity or service, or the use of reproduction of any documentation provided with such equipment, software, commodity or service infringes any United States patent, copyright, trademark or trade secret of any person or entity, which is enforceable under the laws of the United States.

In addition, should the equipment, software, commodity, or services, or its operation, become or in the State's or Professional's opinion be likely to become the subject of a claim of infringement, the Professional shall at the Professional's sole expense (i) procure for the State the right to continue using the equipment, software, commodity or service or, if such option is not reasonably available to the Professional, (ii) replace or modify to the State's satisfaction the same with equipment, software, commodity or service of equivalent function and performance so that it becomes non-infringing, or, if such option is not reasonably available to Professional, (iii) accept its return by the State with appropriate credits to the State against the Professional's charges and reimburse the State for any losses or costs incurred as a consequence of the State ceasing its use and returning it.

Notwithstanding the foregoing, the Professional shall have no obligation to indemnify or defend the State for, or to pay any costs, damages or attorneys' fees related to, any claim based upon (i) equipment developed based on written specifications of the State; or (ii) use of the equipment in a configuration other than implemented or approved in writing by the Professional, including, but not

limited to, any modification of the equipment by the State; or (iii) the combination, operation, or use of the equipment with equipment or software not supplied by the Professional under this Contract.

ARTICLE VII
OWNERSHIP OF DOCUMENTS

All Project deliverables, including but not limited to reports, Bidding Documents, Contract Documents, electronic documents and data, and other Project related documents, including the copyrights, prepared, and furnished by the Professional shall become the property of the State of Michigan upon completion of the Project, completion, and acceptance of the professional's work, or upon termination of the Contract. Project deliverables shall be delivered to the Department upon their request. The Professional shall have no claim for further employment or additional compensation as a result of this Contract requirement. The Professional may retain a copy of all Project documents for their files.

If the Professional is in default or breach of its obligations under this Contract, the State shall have full ownership rights of the Project deliverables, including Bidding Documents and Contract Documents, including all electronic data. If the Professional is in default or this Contract Agreement is terminated, the State shall not use the Contract Documents and deliverables of this Contract for completion of the Project by others without the involvement of other qualified Professionals who shall assume the professional obligations and liability for the Project work not completed by the Professional.

To the fullest extent allowed by law, the State releases the Professional, the Professionals Consultant(s) and the agents and employees of any of them from and against legal claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of the State's use of the Contract Documents other than in accordance with this Contract Agreement.

All Contract deliverables listed may be published or issued for informational purposes without additional compensation to the Professional. The Professional may not use any of the Contract Documents and Contract deliverables for any purpose that may misrepresent the professional services they provided.

The Professional shall retain full rights to the Contract Documents and deliverables and the right to reuse component information contained in them in the normal course of the Professional's professional activities.

The Contract deliverables, Contract Documents, or other documents produced under this Contract may be used by the Department, or others employed by the Department or State of Michigan, for reference in any completion, correction, remodeling, renovation, reconstruction, alteration, modification of or addition to the Project, without monetary compensation to the Professional.

The State of Michigan will not construct additional Projects or buildings based on the work of this Contract without notice to the Professional.

Whenever renderings, photographs of renderings, photographs or models, or photographs of the Project are released by the State of Michigan for publicity, proper credit for design shall be given to the Professional, provided the giving of such credit is without cost to the State of Michigan.

ARTICLE VIII
TERMINATION

The State may, by written notice to the Professional, terminate this Contract and/or any Assignments, in whole or in part at any time, either for the State's convenience or because of the failure of the Professional to fulfill their Contract obligations. Upon receipt of such notice, the Professional shall:

a) Immediately discontinue all professional services affected (unless the notice directs otherwise), and

b) Deliver to the State all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Professional in performing this Contract, whether completed or in process.

8.1 If the termination is for the convenience of the State, an equitable adjustment in the Contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed professional services.

8.2 If the termination is due to the failure of the Professional to fulfill their Contract obligations, the State may take over the work and prosecute the same to completion by Contract or otherwise. In such case, the Professional shall be liable to the State for any additional cost occasioned to the State thereby.

8.3 If, after notice of termination for failure to fulfill Contract obligations, it is determined that the Professional had not so failed, the termination shall be deemed to have been affected for the convenience of the State. In such event, adjustment in the Contract price shall be made as provided in Section 8.1 of this article.

8.4 The rights and remedies of the State provided in this article are in addition to any other rights and remedies provided by law or under this Contract.

ARTICLE IX
SUCCESSORS AND ASSIGNS

This Contract shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns; provided, however, that neither of the parties hereto shall assign this Contract without the prior written consent of the other.

ARTICLE X
GOVERNING LAWS

This Contract shall be construed in accordance with the current laws of the State of Michigan. Some Assignments to this Contract will be funded wholly or in part by the Federal Government through grant agreements and/or federal programs. The Professional must comply with such funding requirements along with any current applicable federal regulations in performing the tasks described in the Scope of Work, including but not limited to the following current federal regulations. The absence of reference to any law or regulation does not preclude its applicability to this Contract.

1. The Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended CERCLA (The Superfund Act).

2. Section 306 of the Clean Air Act (42 U.S.C. 1857 (h)).

3. Section 508 of the Clean Water Act (33 U.S.C. 1368).

4. Public Law 98-473 as implemented in the Department of the Interior, Bureau of Indian Affairs.

5. Executive Order 11738.

6. Office of Management and Budget Circular A-87, "Cost Principles for State, Local, and Indian Tribal Governments."

7. 25 CFR Part 20; Financial Assistance and Social Services Programs
8. 40 CFR Part 31; Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments

9. 40 CFR Part 32 Subpart F; Drug-Free Workplace

10. 40 CFR Part 33; Participation by Disadvantaged Business Enterprises in United States Environmental Protection Agency Programs

11. 40 CFR Part 35; State and Local Assistance

12. 40 CFR Part 35 Subpart 0; Cooperative Agreements and Superfund State Contracts for Superfund Response Actions

13. 48 CFR Chapter 1 Part 31 Subpart 31.2; Contracts with Commercial Organizations.

ARTICLE XI
NONDISCRIMINATION

In connection with the performance of the Project under this, the Professional agrees as follows:

a) The Professional will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, age, sex *(as defined in Executive Directive 2019-09)*, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position. The Professional will provide equal employment opportunities to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

b) The Professional will, in all solicitations or advertisements for employees placed by or on behalf of the Professional, state that all qualified applicants will receive equal employment opportunity consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight, marital status, or a physical or mental disability that is unrelated to the individual's ability to perform the duties of the particular job or position.

c) The Professional or their collective bargaining representative will send to each labor union or representative of workers with which is held a collective bargaining agreement or other Contract or understanding, a notice advising the said labor union or workers' representative of the Professional's nondiscrimination commitments under this article.
d) The Professional will comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended, MCL 37.2201 et seq; the Michigan Persons with Disabilities Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et seq; Executive Directive 2019-09; and all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission which may be in effect on or before the date of award of this Contract.

e) The Professional will furnish and file nondiscrimination compliance reports within such time and upon such forms as provided by the Michigan Civil Rights Commission; said forms may also elicit information as to the practices, policies, program, and employment statistics of the Professional and of each of their Consultant firms. The Professional will permit access to all books, records, and accounts by the Michigan Civil Rights Commission, and / or its agent, for purposes of investigation to ascertain nondiscrimination compliance with this Contract and with rules, regulations, and orders of the Michigan Civil Rights Commission relevant to Article 6, 1976 PA 453, as amended.

f) In the event that the Michigan Civil Rights Commission finds, after a hearing held pursuant to its rules, that the Professional has not complied with the contractual nondiscrimination obligations under this Contract, the Michigan Civil Rights Commission may, as part of its order based upon such findings, certify said findings to the State Administrative Board of the State of Michigan, which the State Administrative Board may order the cancellation of the Contract found to have been violated, and/or declare the Professional ineligible for future Contracts with the State and its political and civil subdivisions, departments, and officers, and including the governing boards of institutions of higher education, until the Professional complies with said order of the Michigan Civil Rights Commission. Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the Professional is declared ineligible to Contract as a contracting party in future Contracts. In any case before the Michigan Civil Rights Commission in which cancellation of an existing Contract is a possibility, the State shall be notified of such possible remedy and shall be given the option by the Michigan Civil Rights Commission to participate in such proceedings.

g) The Professional shall also comply with the nondiscrimination provisions of 1976 PA 220, as amended, concerning the civil rights of persons with physical or mental disabilities.

h) The Professional will include, or incorporate by reference, the nondiscrimination provisions of the foregoing paragraphs a) through g) in every subcontract or Contract Order unless exempted by the rules, regulations, or orders of the Michigan Civil Rights Commission, and will provide in every subcontract or Contract Order that said nondiscrimination provisions will be binding upon each of the Professional's Consultant's or seller.

ARTICLE XII
CONTRACT CLAIMS AND DISPUTES

In any claim or dispute by the Professional which cannot be resolved by negotiation, the Professional shall submit the claim or dispute for an administrative decision by the Department of Technology, Management and Budget, Director of State Facilities Administration within thirty (30) consecutive calendar days of the end of the disputed negotiations, and any decision of the Director of State Facilities Administration may be appealed to the Michigan Court of Claims within one (1) year of the issuance of the Director's decision. The Professional agrees that the Department's appeal procedure to the Director of State Facilities Administration is a prerequisite to filing a suit in the Michigan Court of Claims.

ARTICLE XIII
DEFINITION OF TERMS

The definition of terms and conditions of this Contract are described and outlined in the following Articles I through XIV and attached appendices. The capitalized defined terms used in this Professional Services Contract shall have the following definitions:

ADDENDA: Written or graphic numbered documents issued by the Department and/or the Professional prior to the execution of the Construction Contract which modify or interpret the Project Bidding Documents, including drawings, and specifications, by additions, deletions, clarifications, or corrections.

The Addenda shall: (1) Be identified specifically with a standardized format; (2) Be sequentially numbered; (3) Include the name of the Project; (4) Specify the Project Index No., Project File No., the Contract Order No. Y, and a description of the proposed Addenda; and (5) Specify the date of Addenda issuance.

As such, the Addenda are intended to become part of the Project Contract Documents when the Construction Contract is executed by the Professional's recommended lowest responsive, responsible qualified Construction Contractor. An Addendum issued after the competitive construction Bid opening to those construction Bidders who actually submitted a Bid, for the purpose of rebidding the Project work without re-advertising, is referred to as a post-Bid Addendum.

AGENCY PROJECT MANAGER: The assigned staff of the Department or the State / Client Agency authorized by the State to represent and act on behalf of the Project Director on a given project and to thereby provide direction and assistance to the Construction Contractor. The Agency Project Manager may designate in writing a person to act on behalf of the Agency Project Manager when they are unable to perform their required duties or is away from the office. In such cases, the Agency Project Manager must notify the Construction Contractor and the Design and Construction Project Director.

BID: A written offer by a construction Bidder for the Department. Project construction work, as specified, which designates the construction Bidder's Base Bid and Bid Prices for all alternates.

BIDDER: The person acting directly, or through an authorized representative, who submits a competitive construction bid directly to the Department.

BIDDING DOCUMENTS: The Professional's project contract documents as advertised, and all addenda issued before the construction bid opening, and after the construction bid opening, if the project construction work is rebid without re-advertising. Bidding documents shall consist of: the Phase 500 - Final Design Drawings and Specifications, any Addenda issued, Special, General, and Supplemental Conditions of the Construction Contract, and modifications, if any, to standard forms provided by the Department. Such forms consist of: the Project Advertisement, the Instructions to Bidders, the proposal forms, General, Supplemental, and any Special Conditions of the Construction Contract, and the form of agreement between the Department and the Construction Contractor for the project work requirements.

BID SECURITY: The monetary security serving as guarantee that the Bidder will execute the offered construction contract or as liquidated damages in the event of failure or refusal to execute the construction contract.

BUDGET: The maximum legislatively authorized budget amount to be provided by the State of Michigan and available for a specific purpose or combination of purposes to accomplish the project for this contract.

BULLETIN: A standard document form (DTMB-0485, Bulletin Authorization No. and the DTMB-0489, Instructions to Construction Contractors for Preparation of Bulletin Cost Quotations for Contract Change Orders) used by the Department to describe a sequentially numbered change in the project under consideration by the Department and the Professional and to request the Construction Contractor to submit a proposal for the corresponding adjustment in the contract price and / or contract time, if any. These standard document forms are a part of the "DTMB-0460, Project Procedures" documents package.

CONSTRUCTION CONTRACT: A separate written contract agreement between the Construction Contractor and the Department for the construction, alteration, demolition, repair, or rebuilding of a State / Client Agency building or other State property.

CONSTRUCTION CONTRACTOR: Any construction firm under a separate contract to the Department for construction services.

CONSTRUCTION INSPECTION SERVICES: The Professional's field Inspections of the Project during the construction Phase of this Contract which includes but is not limited to: (1) Documenting the quantity and quality of all Project construction work and verifying that the Project construction work is properly completed; (2) Resolve Project problems that are affecting the Project construction work, certify payment requests, process Bulletins, Contract Change Order recommendations, and requests for information (RFI's) in a timely manner as prescribed in the Department's**,** **"**MICHSPEC Standard Construction Contract and General Conditions for Construction (Long Form)" or the current Department, DTMB-0401 - Proposal and Contract / Front-End Package for Small Projects for Professional Services Contractors (PSC) with General Conditions for Construction and Instructions to Bidders" as adopted and modified by the State of Michigan and incorporated into the Construction Contract; and the (3) Inspection of Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's Project Director / Agency Project Manager and their Department Field Representative that the Project construction work is in compliance with the Professional's design intent and that the Project has been completed by the Construction Contractor in accordance with the Professional's Phase 500 - Contract Documents / drawings and specifications requirements.

The Professional shall provide sufficient Inspections of the Project during the construction Phase to administer the construction Phase field and office services as directly related to the degree of Project complexity, up to and including full-time field Inspections. Construction field Inspections shall occur as the construction field conditions and the Project may require and during the regularly scheduled monthly progress and payment meetings. The Professional shall use for their construction field Inspection services, only personnel having professional expertise, experience, authority, and compatibility with departmental procedures as the Department may approve. The Professional agrees that such characteristics are essential for the successful completion of the Project. Such individuals shall be replaced for cause where the Department determines and notifies the Professional, in writing, of their unacceptable performance.

CONSULTANT: Any individual, firm, or employee thereof, not a part of the Professional's staff, but employed by the Professional and whose professional service cost is ultimately paid by the State of Michigan, either as a direct cost or authorized reimbursement. This includes the recipient(s) of Contract Orders for material, support, and/or technical services. Also, included are persons and firms whose management and / or direction of services are assigned to the Prime Professional as may be provided elsewhere in this Contract.

CONTRACT CHANGE ORDER: A standard document form (DTMB-0403) issued and signed by the State of Michigan and signed by the Professional which amends the Project Design Professional's Contract Documents for changes in the Project / Program Statement or an adjustment in Contract price and / or Contract time, or both.

CONTRACT DOCUMENTS: The Professional's Phase 100 – Study, Final Report and Phase 500 - Final Design Plans / Drawings, Specifications, Construction Contract, Instructions to Construction Bidders, proposal, Bidding Documents, agreement, conditions of the Contract, payment bond, performance / labor and material bond, prevailing wages, all Addenda, and attachments as may be necessary to comprise a Construction Contract for the Project. Specifications for this Contract will be prepared for Division 00 through 49, in the 2004 MasterFormat Outline by the Construction Specifications Institute (C.S.I.), as appropriate for the Project.

CONTRACT MODIFICATION: A form (DTMB-0410) amending the Contract signed by the Department and the Professional. The preparation of Bulletins and Contract Change Orders resulting from changes in the Project / Program Statement or previously unknown on-site field conditions as approved by the Department will be compensated to the Professional by way of the Contract Modification in accordance with the Article II, Compensation text of this Contract. Any Contract Modification of this Professional

Services Contract must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the Department may require. No Contract Modification will be approved to compensate the Professional for correcting, or for responding to claims or litigation for, the Professional's Phase 100 – Study, Final Report and Phase 500 - Contract Documents study / design errors, omissions, or neglect on the part of the Professional.

CONTRACT ORDER: A form (DTMB-0402) issued and signed by the State of Michigan authorizing a Professional to: (1) Begin to incur Project expenses and proceed with the Project on-site; and (2) Provide professional services for the fee amount designated in the Phases of the Contract Order. Issuance of the DTMB-0402 certifies that: (1) The State will enter into a Professional Services Contract for the professional services described in the various Phases of this Contract; and that (2) The proper three (3) sets of Certificate of Insurance documents have been received and accepted by the State along with the approval and signing of the Professional's Professional Services Contract by the FBSA, DCD Director.

DEPARTMENT: The Department of Technology, Management and Budget, Facilities and Business Administration, Design and Construction Division. The Department will represent the State of Michigan in all matters pertaining to this Project. This Professional Services Contract will be administered through the Department on behalf of the State of Michigan and The State / Client Agency.

DESIGN MANUAL: Provides the Professional with information regarding the Department's current "Major Project Design Manual for Professional Services Contractors and State/Client Agencies" review process requirements regarding the uniformity in Contract materials presented to it by the Professional and the State/Client Agency(ies). This manual contains the following noted standards, instructions, and procedures information for: (1) General instructions for planning documents from Phase 100 - Study through Phase 500 - Final Design; (2) Net and gross area / volume; (3) Project cost format; (4) Outline architectural and engineering specifications; (5) Specifications in documentation Phase; (6) Instructions for proposal; (7) Bidders questionnaire; and the (8) Project job sign.

DIRECTOR: The Director of the Department of Technology, Management and Budget or their authorized State of Michigan representative.

DIRECTOR - SFA: The Director of the Department of Technology, Management and Budget, State Facilities Administration, or their authorized State of Michigan representative.

DEPARTMENT FIELD REPRESENTATIVE: An employee of the State under the direction of the Department who provides the Inspection of construction projects for compliance with the design intent of the Professional's Phase 500 - Contract Documents / drawings and specification requirements and the building construction codes. The Department Field Representative is the liaison between the Construction Contractor, the Professional, and the Project Director / Agency Project Manager.
The Project Director / Agency Project Manager, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study / design related problems, construction field problems and to attend Project meetings. Unless delegated by specific written notice from the Department, the Department Field Representative has no authority to order any changes in the Project scope of work or authorize any adjustments in Contract price or Contract time.

INSPECTION: The Professional and their Consultant firm's on-site and/or off-site examination of the Project construction work completed or in progress by the Construction Contractor to determine and verify to the Department's, Project Director / Agency Project Manager and their Department Field Representative that the quantity and quality of all Project construction work is in accordance with the design intent of the Professional's Phase 500 - Contract Documents / drawings and specifications requirements.

KEY PRINCIPAL PERSONNEL / EMPLOYEE: An individual employee of a Professional who is essential for the successful completion of the Project.

NOTICE OF INTENT TO AWARD: A written notice to the Construction Contractor, by the Department accepting the Professional's written recommendation to award the construction Bid to the lowest responsive, responsible qualified construction Bidder. The Notice of Intent to Award letter will also designate the Contract price and itemize the alternates that the Department, at its sole discretion has accepted.

PHASE: A discretely distinguishable step necessary to produce the Project in the course of the Professional providing study, design, and construction administration services.

PRIME PROFESSIONAL SERVICES CONTRACTOR / PROFESSIONAL: An individual, firm, partnership, corporation, association, or other legal entity who is legally permitted by law to sign and seal final design construction Contract Documents and licensed under the State of Michigan's professional licensing and regulation provisions of the Occupational Code (State Licensing Law), Act 299 of the Public Acts of 1980, Article 20, as amended, to practice architecture, engineering, environmental engineering, geology, civil, land surveying, or landscape architecture services in the State of Michigan.

The Prime Professional Services Contractor / Professional is also legally permitted by the State of Michigan's regulation provisions of the State Construction Code, Act 230 of the Public Acts of 1972, as amended, and designated in a Construction Contract by the Department to recommend construction progress payments to the Construction Contractor.

PROJECT: Any new construction, existing site, new utilities, existing building renovation, roof repairs and / or removal and replacement, additions, alteration, repair, installation, construction quality control and material testing services, painting, decorating, demolition, conditioning, reconditioning or improvement of public buildings, works, bridges, highways, or roads authorized by the Department that requires professional study / design services as part of this Contract.

PROJECT COST: The total Project cost including, but not limited to, site purchase, site survey and investigation, hazardous material abatement, construction, site development, new utilities, telecommunications (voice and data), professional fees, construction quality control and material testing services, testing, and balancing services, furnishings, equipment, plan(s) / drawing(s) design code compliance and plan review approval fees and all other costs associated with the Project.

PROJECT DIRECTOR: The professional licensed employee of the Department who is responsible for directing and supervising the Professional's services during the life of this Contract.
The Project Director, or their Department Field Representative, has the authority to require the Professional to respond to and resolve study / design related problems, construction field problems and to attend Project related meetings.

PROJECT/PROGRAM STATEMENT: The Project / Program Statement is provided by the Department and defines the scope of the problem, describes why this Project is desirable, and provides a preferred resolution of the problem.

PROJECT TEAM: The Professional, the Project Director / Agency Project Manager, Department Field Representative, a representative of the State / Client Agency, and others as considered appropriate by the Department.

PUNCH LIST: A list of minor construction Project items to be completed or corrected by the Construction Contractor, any one of which do not materially impair the use of the Project work, or the portion of the Project work inspected, for its intended purpose. A Punch List shall be prepared by the Professional upon having made a determination that the Project work, or a portion of the Project construction work inspected, in concert with the Professional, the Construction Contractor, the Department, the Project Director / Agency Project Manager and their Department Field Representative, and any construction

manager, is substantially complete and shall be attached to the respective DTMB - 0455, Certificate of Substantial Completion form. This standard document form is a part of the "DTMB - 460, Project Procedures" documents package.

SOIL EROSION AND SEDIMENTATION CONTROL: The planning, design and installation of appropriate Best Management Practices (as defined by the most current version of the Department's Soil Erosion and Sedimentation Control Guidebook) designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. and comply with the Soil Erosion and Sedimentation Control in the State of Michigan as regulated under the 1994 Public Act 451, as amended – The Natural Resources Environmental Protection Act, Part 91 – Soil Erosion and Sedimentation Control. Soil Erosion and Sedimentation Control associated with this Contract will be monitored and enforced by the Department of Technology, Management and Budget, State Facilities Administration, Soil Erosion and Sedimentation Control Program.

STATE: The State of Michigan in its governmental capacity, including its departments, agencies, boards, commissions, officers, employees, and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

STATE / CLIENT AGENCY: A Department of the State of Michigan, for whose use the Project will ultimately serve, which requires professional design services.

AGENCY FIELD INSPECTOR: An employee of the State of Michigan under the direction of the State / client Agency who provides the on-site, Inspection of construction Projects for compliance with the study / design intent of the Professional firm's Contract Documents / drawings and specification requirements and the building construction codes. The Agency Field Inspector is the liaison between the Construction Contractor, the Professional, and the Agency Project Manager. The Agency Project Manager, or their Agency Field Inspector, has the authority to require the Professional to respond to and resolve study / design related problems, construction on-site field problems and to attend Project related meetings.

SUBSTANTIAL COMPLETION: The form (DTMB-0445) stating that the Project work, or a portion of the Project work eligible for separate Substantial Completion, has been completed in accordance with the design intent of the Professional's Contract Documents to the extent that the Department and the State / Client Agency can use or occupy the entire Project work, or the designated portion of the Project work, for the use intended without any outstanding, concurrent work at the Project work site, except as may be required to complete or correct the Project work Punch List items.

SUSTAINABLE DESIGN: The Professional's use of a balance of appropriate materials, products and design methods that reduce the impact to the natural ecosystems and be within the Budget constraints of the Project. Sustainable Design shall be used wherever possible by the Professional in their Project design and an itemized list shall be provided with the Professional's Contract Documents that identifies the processes and products.

TASK: Shall mean the following: (1) A quantifiable component of design related professional study / design Task services required to achieve a Phase of the Project; (2) The most manageable sub-element within a study / design Phase; (3) A unique item of work within a study / design Phase for which primary responsibility can be assigned; and (4) Has a time related duration and a cost that can be estimated within a study, design, and construction Phase.

ARTICLE XIV
COMPLETE AGREEMENT/MODIFICATION

This Professional Services Contract constitutes the entire agreement as to the Project between the parties. Any Contract Modification of this Contract and the Project / Program Statement scope of work requirements must be in writing, signed by duly authorized representatives of the parties, and shall be in such format and detail as the State may require. No Contract Modification may be entered into to

compensate the Professional for correcting, or for responding to claims or litigation for the Professional firm's final design Contract Documents/study/design errors, omissions, or neglect on the part of the Professional.

APPENDIX 1

PROJECT/PROGRAM STATEMENT

MINOR STATE CAPITAL OUTLAY PROJECTS

REQUEST FOR PROPOSALS
FROM
PROFESSIONAL SERVICE CONTRACTORS

(Authority PA 431 of 1984)

For Indefinite-Service, Indefinite-Delivery
Not-to-Exceed Fee, Billable-Rate

Professional Services For

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

Request for Proposal for
2023 Indefinite Scope Indefinite Delivery (ISID) for
Expanded Environmental Remediation Services
Various Locations, Michigan

PROPOSAL DUE DATE: May 4, 2023, 2:00 p.m., Eastern Standard Time

ISSUING OFFICE

Department of Technology, Management & Budget
State Facilities Administration
Design and Construction Division

Minor State Capital Outlay Projects
REQUEST FOR PROPOSALS

Professional Services for
Department of Technology, Management and Budget
2023 Indefinite Scope Indefinite Delivery (ISID) for
Expanded Environmental Remediation Services
Various Locations, Michigan

Part I – Technical Proposal
Part II – Cost Proposal

SECTION I GENERAL INFORMATION

I-1 Purpose

This Request for Proposals (RFP) provides the prospective professional service contractor (Professional) with information to enable preparation of a professional services proposal for Indefinite-Service, Indefinite-Delivery (ISID) Contracts. ISID contracts provide the State of Michigan with a simple, streamlined, qualifications-based selection process for obtaining professional architectural and engineering services for minor and/or routine design and construction projects. Professionals holding an ISID contract may be contacted by a Department of Technology, Management and Budget (DTMB), State Facilities Administration (SFA), Design and Construction Division (DCD) Project Director to provide a specific proposal of services and fee for a particular project, which, if found acceptable, will then be assigned to that Professional under their ISID contract. DCD reserves the option of requesting such informal proposal from more than one professional for a particular project. Services requested may include, but may not be limited to evaluate, design and/or supervise the implementation of abatements/remedies at assigned sites of environmental contamination under Parts 201 and 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA) 1994 P.A. 451, as amended; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and other relevant federal and state statutes and requirements.

Firms with ISID contracts are eligible to participate in MIDeal, a cooperative purchasing program, local units of government, K-12 schools, state colleges and universities, and not for profit hospitals, may, if the firm agrees to participate, contract with an ISID contract holder at the billable rates specified in the ISID contract.

Please Note:

1. **FIRMS HOLDING ISID CONTRACTS ARE NOT GUARANTEED ANY ASSIGNMENTS**

ISID contracts may include any of the following phase(s) from DTMB's attached Sample Standard ISID – Environmental Contract for Professional Services:

Phase	
100	Study
200	Program Analysis
300	Schematic Design
400	Preliminary Design
500	Final Design
600	Construction Administration - Office Services
700	Construction Administration - Field Services
900	Operation and Maintenance Management – Remediation Facility

The minimum professional qualifications to complete the scope of work for this project are demonstrated experience in the successful planning and execution of similar projects in full accordance with all applicable Local, State, and Federal regulations.

I-2 Project/Program Statement

See Attachment I, "Project/Program Statement-Scope of Work" for more detailed information. The Professional, by submitting a proposal to DTMB for evaluation, states they can and will provide complete services when an individual project is assigned to them.

No increase in compensation to the Professional will be allowed unless there is a material change made to the scope of work of the Assignment/Program Statement and the change is accepted and approved, in writing, by the State.

I-3 Issuing Office

This RFP is issued by DTMB, on behalf of the State/Client Agency. PROPOSALS SHALL BE RETURNED TO THE ISSUING OFFICE. The point of contact for this RFP is:

Sadi Rayyan
Department of Technology, Management and Budget
State Facilities Administration, Design and Construction Division
3111 W. St. Joseph Street
Lansing, MI 48917
Telephone Number: 517.719.2801
Email: RayyanS@michigan.gov

I-4 Contract Award

The State intends to award contracts to establish a list of firms that can provide one or more specialty services under this ISID as defined in this RFP (See Attachment I Project/Program Statement – Scope of Work). Professionals are requested to submit a proposal in two parts: **Part I – Technical Proposal and Part II – Cost Proposal.**

In addition, to the two parts, the proposal is not considered complete unless all required attachments are provided. **The required attachments to be completed are Attachment II Professional Questionnaire; Attachment III Position, Classification, Employee Billing Rate form; and one or more set of the Specialty Technology Questionnaire (Attachment IV) along with a corresponding experience summary form. Fillable forms for each of these is provided as supplemental documents to this RFP**. A proposal submitted without at least one set of Specialty Technology Questionnaire and a corresponding experience summary form, is not considered complete and cannot be evaluated.

All submissions will be evaluated by an Ad Hoc Advisory Committee and scored accordingly. Firms will be first evaluated for their overall expertise based on all required submissions except for the Specialty Technology Questionnaire(s). The technical portion will account for eighty percent (80%) and the cost portion will account for twenty percent (20%) of the total score. The Ad Hoc committee will then evaluate the submitted questionnaire(s) and supporting documents for each of the marked specialty technologies to establish a list of qualified firms for each specialty technology service. Further information on Proposal evaluation can be found under Scope of Work in Attachment I.

DTMB will award a contract to one or more Professional(s) recommended by the Ad Hoc Advisory Committee after their evaluation of the Proposals. Recommendation is expected within approximately forty-five (45) days following the due date of the proposal.

I-5 Rejection of Proposals

The state reserves the right to reject any or all proposals, in whole or in part, received in response to this RFP.

I-6 Incurring Costs

The state is not liable for any cost incurred by the Professional prior to acceptance of a proposal and the award and execution of a contract and issuance of the state's contract order.

I-7 Mandatory Pre-Proposal Meeting

NO MANDATORY PRE-PROPOSAL MEETING will be conducted by the Issuing Office for this RFP.

Questions on this RFP **MUST BE SUBMITTED, IN WRITING,** to RayyanS@michigan.gov, no later than 12:00 p.m., April 12, 2023. In the event it becomes necessary to amend any part of this RFP, addenda will be posted on the State of Michigan Sigma Vendor Self Service (Sigma VSS) website.

I-8 Responsibilities of Professional

The Professional will be required to assume responsibility for all professional services offered in the proposal regardless of whether the Professional possesses the services within their organization. Further, the state will consider the Professional to be the sole point of contact regarding contractual matters, including payment of all charges resulting from the contract. The Professional shall possess a license to operate and practice business in the State of Michigan pursuant to the Occupational Code (PA 299 of 1980).

I-9 Proposals

The professional must submit a complete, straightforward response to this Request for Proposal. The proposal should describe the professional's ability to meet the requirements of the Request for Proposal.

The proposal must be submitted electronically through the State of Michigan Procurement System (SIGMA VSS). No other distribution of proposals will be made by the Professional. To be considered responsible and responsive, proposals must be uploaded to SIGMA VSS **on or before 2:00 p.m., Eastern time (ET), on Thursday, May 4, 2023.** Proposal must be signed by an official authorized to bind the professional firm to its provisions. NO FACSIMILES OR E-MAILS OF THE REQUEST FOR PROPOSAL WILL BE ACCEPTED.

The proposal and attachments must be fully uploaded and submitted prior to the proposal deadline. **Please do not wait until the last minute to submit a proposal**, as the SIGMA VSS system **will not** allow a proposal to be submitted after the proposal deadline identified in the solicitation, even if a portion of the proposal has been uploaded.

SIGMA has a maximum size limit on file uploads. When uploading, your attachment(s) the attachment must be 6mb or less.

Also, when entering proposal amount, please enter the total cost amount as the bid amount. Bidder's failure to submit a proposal as required may result in being deemed nonresponsive.

Questions on vendor registration, proposal submissions, or navigation in the SIGMA VSS system can be answered by contacting the SIGMA Help Desk either by telephone at 517.284.0540 or toll free at 888.734.9749 or by email at sigma-procurement-helpdesk@michigan.gov
.

SECTION II PROPOSAL FORMAT - PART I - TECHNICAL PROPOSAL

The proposal must be submitted in the format outlined in this RFP. Paginate and ensure the proposals refer specifically to the project described. Ensure proposals are free of typographical and mathematical errors.

The Professional submitting a proposal must complete both Part I and Part II of the proposal and attach the Professional Questionnaire (see attachment II for sample document) and the Position, Classification and Employee Billing Rate form (see Attachments III for sample document). The Professional must also submit one specialized technology questionnaire (see Attachment IV for a sample) and associated experience summary per technology for which they are seeking consideration. Employee resumes related to both questionnaires should also be submitted. Fillable forms are uploaded as supporting documents to this RFP.

II-I General Information and Project Team

Provide the full name and address of the organization, contact name and email address(es). If applicable, list the branch office, sub-consultants, or other subordinate elements that will assist in providing services. Indicate whether the Professional operates as an individual, partnership, or corporation. If a corporation, include the state of incorporation. Indicate whether the Professional is licensed to operate and practice in the State of Michigan.

Within the last 5 years, has your company or any of its related business entities defaulted on a contract or had a contract terminated for cause? If yes, provide the date, contracting entity, type of contract, and details about the termination or default.

If awarded a contract, state the specific SIGMA business address which you would like associated for all communication (Contracts, Contract Order, Contract Modifications and Payments)?
Please list all person(s) authorized to receive and sign a resulting contract and / or subsequent assignment(s). Please include persons name, title, address, email and phone number The Professional must include the Certification and Addendum Acknowledgment forms at the end of this RFP as part of your proposal response.

II-2 Understanding of Project and Tasks

Explain your understanding of the scope of work, ISID contracts, assignments to ISID contracts, and how the Professional or project team is most qualified to provide the services required for these projects and can provide the best value to the State of Michigan for this work.

II-3 Personnel

The professional must be able to staff a project team which has the qualifications and expertise necessary to undertake small facility preservation, maintenance, and alterations projects. Include the full names of all personnel by classification that will be employed in the project. Indicate which of these individuals you consider to be “Key Personnel” for the successful completion of these project types, identify them by position and classification and provide their resumes.

The Professional must identify all Key Personnel that will be assigned to this contract in the table below which includes the following:

a. Name and title of staff that will be designated as Key Personnel.

b. Key Personnel years of experience in the current classification.

c. Key Personnel’s roles and responsibilities, as they relate to this RFP, if the Professional is successful in being awarded the Contract. Descriptions of roles should be functional and not just by title.

d. Identify if each Key Personnel is a direct, or consultant employee.

e. Identify where each Key Personnel staff member will be physically located (city and state) during the Contract performance.

The Professional must provide detailed, chronological resumes of all proposed Key Personnel, including a description of their work experience relevant to their proposed role as it relates to the RFP. Qualifications will be measured by education and experience with particular emphasis to experience on projects similar to that described in the RFP.

Include all submitted resumes under one Appendix.

Provide an organization chart outlining authority and communication lines for each professional firm, including Key Personnel, including sub-consultants, client agency, and DTMB.

II-4 Management Summary, Work Plan, and Schedule for Individual Assigned Projects

This is for reference only and will be required for future assignments but not required for this proposal at this time. The Professional must outline their work plan and methodology so that it is understood what services and deliverables will be provided, and the quality of the services and deliverables. Describe in detailed narrative form, the plan for accomplishing the project. Describe clearly and concisely each professional task, event, and deliverable required for project completion. Do not simply reiterate language and tasks from the DTMB Professional Services Contract. Describe your constructability review and quality control plan. Include a detailed time sequenced-related but undated schedule, showing each event, task, and phase in your work plan. Allow time in the assignment schedule for Owner's review.

II-5 References

Provide references, with contact information, of previous clients, particularly for similar projects. Outline the Professional's experience with similar projects, sites, and clients. Experience with projects located in Michigan is preferred.

SECTION III COST PROPOSAL FORMAT - PART II

III-1 Instructions and Information – Billable Rate

Outline the billable rates for the Professional's staff members who may be assigned to these projects. Specific proposals for individual projects will be obtained at the time of individual project assignment and shall correspond to all phases/tasks of the work plan requested at that time.

If sub-consultants are used for a particular assigned project, their fees shall be provided. **No mark-up** of the sub- consultants' fees or billing rates will be allowed.

Reimbursable Expenses: The State will reimburse the Professional for the actual cost of printing/reproduction and shipping of project deliverables such as surveys, reports, and bidding documents (drawings and specifications). The State will also reimburse for U.S. Mail regular shipping or postage for soil boring/groundwater samples, and any required laboratory testing. **No mark-up** of reimbursable expenses will be allowed.

The Professional firm's hourly billing rate shall be the actual amount paid for the employee services on the Project including fringe benefits, vacations, sick leave, other indirect costs, and profit. The Professional firm's hourly billing rates shall not change during the life of this Contract without written approval by the Department. See attached**, Overhead Items Allowed for the Professional Services Contractor Firm's Hourly Billing Rate Calculation**, for the guide to overhead items allowed for the professional services contractor firm's hourly billing rate calculation. Reimbursement for the Project/Program Statement scope of work requirements will be provided only for Department approved items authorized for reimbursement compensation in this Contract. The State will not reimburse the Professional for downtime, or for personnel involved in downtime due to mechanical problems or failure of Professional's or sub-consultant/subcontractor equipment.

Project related travel expenses (mileage, meals, lodging) for Projects **more than** one hundred (100) miles in one-way from the Professional's nearest office shall be treated as an authorized reimbursable expense at the State of Michigan's current travel rates, based on DTMB's Vehicle and Travel Services Travel Rate Reimbursement for premium mileage rates in effect at execution of the contract.

III-2 Identification of Personnel and Estimated Compensation

Provide compensation information for the Professional as well as any Sub-consultants. Note that employees of a separate professional firm or consultant, if proposed, should also be included, and noted.

A. Primary Professional and Sub-consultant(s) – Position, Classification & Employee Billable Rate Information

Using the format of Form II-2-A (attached), identify the service being provided and the Professional's or Sub-consultant's employee(s) names and position classifications. See Attachment III for guidelines for position classifications. For each employee, list the current hourly billable rate for each year covered under this proposal, Hourly billing rates shall include any anticipated pay increases over the life of the Professional's three-year ISID contract duration. Sub-consultant fees will be included in individually assigned project contracts as not-to-exceed reimbursable amounts. To determine current billing rates, see Section III-1.

For individual assigned projects, the proposal will identify the estimated cost for each task. The total of all phases/tasks shall become the Professional's maximum not-to-exceed cost for the assigned project. Compensation for each phase will be in accordance with the attached sample contract Article II – Compensation. The following items B, C, and D will be required only at the time a proposal for an individual assigned project is requested.

Forms II-2-B, C, and D are for reference only and will be required for future assignments. These forms are not required for this proposal at this time.

B. Fee with Anticipated Hours by Phase – **for Individual Assigned Projects**

Using the format of Form II-2-B, identify for each phase the estimated hours for each employee and include the billable rate for each employee. Provide totals.

C. Reimbursable Expenses – **for Individual Assigned Projects**

Using the format of Form III-2-C, identify the phase number, firm name and description of sub-consulting services expressed as a not-to-exceed amount. Identify the phase number, firm name, and description of all reimbursable direct expenses expressed as a not-to-exceed amount (travel over 100 miles one-way, printing, tests, etc.). Note the mark-up(s) for handling reimbursable expenses. Provide totals.

D. Total, Summarized by Phase – **for Individual Assigned Projects**

Using the format of Form III-2-D, provide a total of the fees and reimbursable expenses, by phase, as outlined in items B and C above. The total of all phases shall become the Professional's maximum not-to-exceed contract for the assigned project. Compensation for each phase will be in accordance with the "Sample Expanded Environmental Remediation ISID Contract for Professional Services

SECTION IV PROPOSAL FORMAT - SPECIALIZED TECHNOLOGIES INFORMATION

The Professional **must** respond to at least one of the specialized technologies listed in this RFP (see 'Expertise in Remedial Technologies' in the Scope of Work). For each specialized technologies responded, the Professional must submit one completed Professional Questionnaire (see Attachment IV for the sample fillable form document) and a corresponding Experience Summary Form for each remedial technology requesting consideration, as described in Appendix I Project/Program Statement – Scope of Work, under Expertise in Remedial Technologies.

In completing the applicable questionnaires, answer the questions precisely, and describe the Professional's experience in the subject technology. **Include all the submitted resumes for both the Professional and Specialty Technology Questionnaire under one Appendix**.

For assistance in completing the Experience Summary Forms, see the example provided with this RFP. A separate Experience Summary Form is required for each technology the Professional is seeking to provide. The Experience Summary Forms must include the extent of which the work related to the subject technology was performed by the Professional, by their Michigan Offices, and by their sub-consultants. This information can be recorded in the three columns to the right of the Experience Summary tables.

More information about the technologies and screen matrix of their performance, can be found at the Inter State Technology and Regulatory Council (ITRC) and the Federal Remediation Technologies Roundtable (FRTR) website.

The following instructions are to be used by the Professional to determine the hourly billing rate for assignments under this ISID contract.

The Professional must submit a separate hourly billing rate for their subcontractors who will be subcontracted to provide services for State of Michigan Projects. **No mark-up of the subcontracted Professional's services hourly billing rates will be allowed**.

The Department will reimburse the Professional for the actual cost of printing and reproduction of the Contract Bidding Documents, soil borings, surveys, and any required laboratory testing services and use of field equipment. **No mark-up of these Project costs will be allowed**.

2023 HOURLY BILLING RATE

Based on 2022 Expenses

OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

SALARIES:	**EMPLOYEE BENEFITS**:	**INSURANCE:**
Principals (Not Project Related)	Hospitalization	Professional Liability Insurance
Clerical / Secretarial	Employer's Federal Insurance Contributions Act (FICA)Tax	Flight and Commercial Vehicle
Technical (Not Project Related)	Unemployment Insurance	Valuable Papers
Temporary Help Tax	Federal Unemployment	Office Liability
Technical Training	Disability	Office Theft
Recruiting Expenses	Worker's Compensation	Premises Insurance
	Vacation	Key – Personnel Insurance
	Holidays	Professional Liability Insurance
	Sick Pay	
	Medical Payments	
	Pension Funds	
	Insurance - Life	
	Retirement Plans	

TAXES:	**SERVICES (PROFESSIONAL)**	**EQUIPMENT RENTALS**:
Franchise Taxes	Accounting	Computers
Occupancy Tax	Legal	Typewriter
Unincorporated Business Tax	Employment Fees	Bookkeeping
Single Business Tax	Computer Services Bond)	Dictating
Property Tax	Research	Printing
Income Tax	Project / Contract Bond	Furniture and Fixtures
		Instruments

OFFICE FACILITIES:

Rents and Related Expenses
Utilities
Cleaning and Repair

LOSSES:

Bad Debts (net)

Uncollectible Fee
Thefts (not covered by Project / Contract)
Forgeries (not covered by Project / Contract)

FINANCIAL:

Depreciation

SUPPLIES:

Postage

Drafting Room Supplies
General Office Supplies
Library
Maps and Charts
Magazine Subscriptions

PRINTING AND DUPLICATION:

Specifications (other than Contract Bidding documents)
Drawings (other than Contract Bidding documents)
Xerox / Reproduction

Photographs

SERVICES (NONPROFESSIONAL):

Telephone and Telegram

Messenger Services

TRAVEL:

All Project – Related Travel* (refer to page 13)

MISCELLANEOUS:

Professional Organization Dues for Principals and Employees
Licensing Fees

II-2-A. Position, Classification and Employee Billing Rate Information

Firm Name **XYZ, Inc.**

Yearly Hourly Billing Rate Increase **≈4%**

Position / Classification	2023	2024	2025	2026	2027
Principal/Program Manager**	$100.00	$105.00	$110.00	$116.00	$122.00
Senior Eng.	$100.00	$105.00	$110.00	$116.00	$122.00
Quality Control/Assurance	$100.00	$105.00	$110.00	$116.00	$122.00
Licensed Surveyor**	$90.00	$95.00	$99.00	$104.00	$109.00
Project Engineer**	$90.00	$95.00	$99.00	$104.00	$109.00
Project Geologist**	$90.00	$95.00	$99.00	$104.00	$109.00
Engineer	$80.00	$84.00	$88.00	$92.00	$97.00
Hydrogeologist	$80.00	$84.00	$88.00	$92.00	$97.00
Scientist/Surveyor	$65.00	$68.00	$71.00	$75.00	$79.00
Staff Engineer	$65.00	$68.00	$71.00	$75.00	$79.00
Staff Geologist	$65.00	$68.00	$71.00	$75.00	$79.00
Senior Technician	$75.00	$79.00	$83.00	$87.00	$91.00
Technician	$65.00	$68.00	$71.00	$75.00	$79.00
Field Technician	$50.00	$53.00	$56.00	$59.00	$62.00
Technical Support	$35.00	$37.00	$39.00	$41.00	$43.00

*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the "Sample Standard Contract for Professional Services," Article 5, Compensation Text.

** Key Project Personnel

II-2-B. Fee with Anticipated Hours and Billing Rate – Use for Individual Assigned Project Proposal

POSITION/ CLASSIFICATION	TOTAL HOURS	BILLING RATE	TOTAL
Principal/Project Manager	30	$100.00	$3,000.00
Senior Engineer	17	$100.00	$1,700.00
Quality Control/Assurance	2	$100.00	$ 200.00
Licensed Surveyor	9	$ 90.00	$ 810.00
Project Engineer	8	$ 90.00	$ 720.00
Project Geologist	8	$ 80.00	$ 640.00
Engineer	8	$ 80.00	$ 640.00
Hydrogeologist	22	$ 80.00	$1,760.00
Field Technician	40	$ 50.00	$2,000.00
Senior Technician	42	$ 75.00	$3,150.00
SUBTOTAL	**186**		**$14,620.00**

II-2C. Authorized Reimbursables -- Sub-consultants, Testing and Expenses – Use for Individual Assigned Project Proposal

PHASE	NAME OF FIRM	DESCRIPTION OF SERVICES PROVIDED	TOTAL AMOUNT* (Including mark-up)
Phase 400	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
Phase 500	XYZ Productions, Inc. Lansing, Michigan	Printing and reproduction of bidding documents	500.00
Phase 500	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
Phases 400, 500, 700	Travel Allowance	Travel between office and project (site over 100 miles one-way from office)	1,000.00
	SUBTOTAL		**$ 2,500.00**

II-2D. Total, Summarized By Phase -- Use for Individual Assigned Project Proposal

PHASE	Phase 300	Phase 400	Phase 500	Phase 600	Phase 700	TOTAL
Professional Fee	2,550.00	3,820.00	4,970.00	1,620.00	1,660.00	14,620.00
Reimbursable Expenses	0.00	750.00	1,250.00	0.00	500.00	2,500.00
SUB-TOTAL	**2,550.00**	**4,570.00**	**6,220.00**	**1,620.00**	**2,160.00**	
TOTAL CONTRACT AMOUNT						**$ 17,120.00**

2023 ISID Expanded Environmental Remediation
Experience Summary

Remediation Technology: *Excavation, Dewatering & Off-Site Disposal*

Professional's Name: *Sample Professional's Name, Inc.*

Components/Technics: (check all that apply) ☒ Excavation ☒ Dewatering ☒On-Site Treatment of Water

☐Backfilling w/Asphalt Cover ☒ Backfilling w/Concrete Cover ☒ Applied Treatment Train

☒ Sheet Piling/Soil Retention ☒ Stabilization ☒ Storm Water Management

☒ Sediment Removal

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	20	20	2
Construction Oversight	10	10	0
O & M	5	5	0
Closed	15	15	0
Used Treatment Train	7	7	1
2. Range of cost per project:			
Design Phase	$50,000-$100,000	$50,000-$100,000	$5,000-$15,000
Construction Phase	$100,000-$250,000	$100,000-$250,000	$0
O & M Phase	$10,000-$50,000	$10,000-$50,000	$0
Total Project Cost	$50,000-$500,000	$50,000-$500,000	$5,000 - $50,000
3. Number of the above projects that were:			
Below Budget	4	4	0
On Budget	21	21	2
Over Budget*	0	0	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	1	1	0
Licensed Chemical Engineers	1	1	0
Geologists	0	0	1
Hydrogeologists	1	1	0
Licensed Surveyors	0	0	1
Licensed Electrical Engineers	0	0	1
Licensed Mechanical Engineers	0	0	1
Environmental Scientist	1	1	0
Biologists	0	0	1

*Provide explanation, including strategies implemented to fix the issue:

_____

ATTACHMENT I

PROJECT/PROGRAM STATEMENT - SCOPE OF WORK

DTMB-0427 (R 10/22)

PROJECT STATEMENT

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design and Construction Division
3111 West St. Joseph
Street
Lansing, Michigan 48909

FILE NUMBER Various		PROPOSAL DUE DATE Thursday, May 4, 2023, at 2:00 p.m., EASTERN
CLIENT AGENCY Various		
PROJECT NAME AND LOCATION 2023 Expanded Environmental Remediation Services ISID		
PROJECT ADDRESS (if applicable) Various		
CLIENT AGENCY CONTACT Various		TELEPHONE NUMBER Various
DTMB - DCD PROJECT DIRECTOR Sadi Rayyan		TELEPHONE NUMBER 517.719.2801

WALK-THROUGH INSPECTION DATE, TIME, AND LOCATION:
N/A

PROJECT DESCRIPTION/SERVICES REQUESTED

Provide professional environmental Indefinite-Service, Indefinite-Delivery (ISID) services for a variety of state or federally funded cleanup sites. The professional will be required to effectively perform tasks at assigned contaminated and/or hazardous waste sites through appropriate investigations and/or remedial/corrective action plans with the goal of bring the assigned sites to an acceptable closure in accordance with the applicable Part 201 or Part 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and other relevant state and federal statutes and requirements. Activities may include environmental site assessments, investigations, feasibility studies, design, construction oversight and operation and maintenance (O&M) of remedial systems. The Professional is required to refer to State and Federal statutes, procedures, guidelines and the administration rules when providing the services or entering into contracts with sub-consultants/subcontractors to provide the services. . The Professional MUST upload their proposal to the State of Michigan Procurement website (SIGMA VSS). The Professional **must complete and submit the Professional Questionnaire, one or more of the Speciality Technology Questionnaire and an associated Experience Summary Form; the Position, Classification and Employee Billing Rate Information Form, to indicate the billing rates and the employees resumes relevant to the entire proposal for the proposal to be considered complete**. When the professional want to be considered for selection for more than one specialized technology, a separate set of specialized technology questionnaire and experience summary form, must be submitted for each technology that they are interested in providing design and construction oversight services. The State reserves the right not to award the contract(s) or award the contract(s) to one or more firms.

Please NOTE:

- Proposal responses MUST be uploaded to SIGMA VSS. Please enter the $1.00 as the bid amount.
- Firms should only submit one (1) attachment (being less than 6 MB) for proposal submission. The attachment is to be the technical and cost proposal combined.
- Do not wait until just before the 2:00 p.m. solicitation deadline to submit your proposal response. SIGMA VSS will not allow a proposal to be submitted after 2:00 p.m., even if a portion of the proposal response has been uploaded.

- If you experience issues or have questions regarding your electronic submission, you **must** contact the SIGMA Help Desk for assistance prior to the 2:00 p.m., solicitation deadline. You may contact the SIGMA Help Desk by telephone at 517.284.0540 or toll-free at 888.734.9749. You may also email the SIGMA Help Desk at sigma-procurement-helpdesk@michigan.gov
- Please email the Design and Construction Contract Specialists if you are having SIGMA VSS issues. Please include your SIGMA ticket number and any supporting documentation (i.e., screenshots) to Anne Watros (WatrosA@michigan.gov) **and** Don Klein (KleinD4@michigan.gov).
- You may be asked by our contract specialists to email your proposal. Emailed submissions will require DCD approval and will be handled on a case-by-case basis.
- Approved emailed submissions MUST be received prior to 2:00 p.m. deadline to be considered responsive and responsible.
- Responses should not be emailed to the Project Director.

NIGP CODES
90629; 91842; 91843; 92535; 92577; 92615; 92623; 92629; 92630; 92645; 92652; 92658; 92678; 92683; 92685; 92690; 92691; 92693; 92696; and 92673

DESIRED SCHEDULE OF WORK
Dependent on the assigned project

ACCEPTING RFP QUESTIONS UNTIL:
Please do not submit online questions via VSS. ALL questions should be emailed to Sadi Rayyan at rayyans@michigan.gov address no later than 12:00 p.m., Eastern on Wednesday, April 12, 2023

REFERENCE STANDARDS: This project will comply with all codes, standards, regulations, and workers' safety rules that are administered by federal agencies (EPA, OSHA, and DOT), state agencies (DHHS, EGLE, DNR, and MIOSHA), and any other local regulations and standards that may apply.

This form is required to be a part of the professional service contract. (Authority: 1984 PA 431)
Attachment(s)

Department of Technology, Management and Budget
2023 ISID Expanded Environmental Remediation RFP
Professional Environmental Consulting Services
Scope of Work

SUMMARY

The State of Michigan is requesting the services of Professional Services Contractor(s) (Professional) to provide high-quality environmental services to investigate, evaluate, design, and supervise the implementation of abatements/remedies at assigned sites of environmental contamination under Parts 201 and 213 of the Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); and other relevant federal statutes and requirements. The State intends to form a primary list of firms with specialty technologies. The Professionals in the primary list must be able to perform tasks required by the remedial investigation (RI), feasibility study (FS), risk-based-corrective-action (RBCA), community relations environmental assessments, natural resource damages assessments, and other related tasks for passive/active monitoring. If the Professional chooses to be considered for one or more of the specialized technologies, the Professional must be able to perform tasks required for the design, bid specifications, construction oversight or remedial actions to bring the assigned site(s) into compliance with current state and federal environmental requirements.

To be selected, preference will be given to firms, in the State of Michigan, generally meeting the following requirements.

- Experience working at Parts 201 and 213 of NREPA 1994 P.A. 451, as amended sites.
- Experience working at CERCLA regulated sites.
- Experience in conducting effective environmental assessment, RI, and FS services.
- Experience with the development of human health and ecological risk assessments.
- Experience with the development of human health and ecological risk assessments.
- Experience with database development and management.
- Ability to perform sampling and provide technical review and Quality Assurance/Quality Control (QA/QC) of provided laboratory data.
- Ability to provide comprehensive professional services for the assigned projects.
- Accounting systems with capability to provide detailed cost documentation.
- Consideration will be given to the number and location of the satellite offices, record of past performance, and financial and technical resources.
- Experience with projects located in Michigan is preferred.

To be selected for a remediation technology, preference will be given to firms in the state of Michigan generally meeting the following requirements related to the services identified under **EXPERTISE IN REMEDIAL TECHNOLOGIES** in this document.

- Experience in conducting effective remediation system design and construction oversight services.
- Experience in preparation of specifications/construction documents.

- Ability to perform sampling and provide technical review and QA/QC of operation and maintenance (O&M) activities.
- The number and location of satellite offices, record of past performance, and financial and technical resources.
- Expertise with the selected treatment technologies, allowing for the appropriate design and successful implementation of the selected design.
- Experience with projects located in Michigan preferred.

Thousands of contaminated sites have been identified in Michigan. This includes sites appearing on the list of contaminated sites authorized by Part 213 and Part 201 of the NREPA 1994 PA 451, as amended. Major steps in resolving the contamination problems at these sites are RI, FS, remedial design, and construction oversight services. The State, through review and evaluation of the responses to this RFP, anticipates selecting one or more Professionals to perform remedial design services and construction oversight activities along with RI/FS services at selected sites of environmental contamination. The professional will be required to provide professional environmental services, technical staff, and support personnel for the ISID minor projects on an as-needed basis for various State/Client Agencies within the State of Michigan.

The executed contract will be for professional environmental services for an unspecified number of ISID projects. The scope of work for each assigned project will be defined at the time the project is awarded by the State to the Professional.
The professional environmental services required for each of these assigned projects requested by the Department may include any or all the Tasks included in the Phase 100 – Study through the Phase 900 – Operation and Maintenance Management (OM&M) as detailed in the attached SAMPLE contract.

SCOPE OF WORK

The professional environmental services to be performed at sites of environmental contamination may include but not be limited to:

1) geophysical studies.
2) hydrogeological investigations.
3) underground storage tank (UST) removal/closure.
4) sampling and analysis of hazardous materials and containers (waste piles, drums, tanks, etc.).
5) collection and analysis of soil, sediment, flora, fauna, water, and air samples.
6) evaluation of sample data.
7) risk-based corrective actions.
8) evaluation and development of disposal and remedial alternatives.
9) preparation of environmental impact statements.
10) remedial action design including development of plans/drawings and specifications.
11) natural resource damage assessments.
12) construction oversight or construction management services and
13) O&M of remediation and mitigation systems /oversight of O&M services.

While performing this work, the Professional may be required to develop site specific project work plans, health and safety plans (HASPs), QA/QC plans, and community relations plans.

In addition to these activities, the State may request the Professional to perform the following additional tasks, including but not limited to: professional assistance for assessing potential uncontrolled hazardous material sites; obtain any permits which are required for the performance of the work; conduct work in a timely manner; provide site security of the site materials and equipment; comply with the State Environmental Policy Act and local, State and Federal permit requirements prior to conducting remedial actions; provide enforcement support, such as documentation of facts and information about a site and expert testimony during enforcement proceedings; and provide other program development and management assistance for the State departments/agencies. This assistance may include review of plans, drawings, specifications, proposals, technical reports, and other work products associated with a hazardous substance/contaminated site where a release has occurred or is likely to occur; the assessment of environmental and public health risks; record searches; historical reviews; research on technical issues; and personnel training.

EXPERTISE IN REMEDIAL TECHNOLOGIES

To be selected, the Professional must provide sufficient information for verifying design and construction oversight expertise in one or more of the following remediation technologies. Please keep in mind that it will be desirable to utilize green/sustainable remediation or similar holistic approach to site planning, investigation, assessment of remedial alternatives, remedy selection, remedy design, and construction and implementation of the chosen remedy.

I. Excavation, Dewatering and Off-Site Disposal

Excavation, dewatering, on-site treatment of water, backfilling (with clean imported fill), providing asphalt/concrete/ permeable pavement cover, applied treatment train, sheet piling/soil retention, stabilization, storm water management, sediment removal.

II. Demolition

Pneumatic/hydraulic beakers, mechanical demo & dismantling, pressure/mechanical/chemical bursting, explosives, ball & crane, recycling, excavation/dewatering/sheet piling, backfilling (with clean imported fill), providing asphalt/concrete cover, asbestos/lead abatement experience.

III. Migration Control, Fluid Removal, and Containment

Slurry walls, purge well barriers, sheet piling, groundwater pump & treat, dual and multi-phase extraction, soil vapor extraction (SVE), impermeable capping (e.g., clay caps), natural source zone depletion (NSZD), monitored natural attenuation, sediment caps, constructed treatment wetlands.

IV. Landfills

Caps, leachate control/O&M, methane gas control (on-site and off-site).

V. Indoor Air/Vapor Intrusion

Indoor air sampling/abatement, supply and monitor air purifying units (APUs), vapor pin installation, soil gas well installation, vapor barrier installation, SVE Systems, monitoring systems, passive, and active sub-slab depressurization.

VI. In-Situ Physical/Chemical Treatment

SVE/air sparge, solidification/stabilization, chemical oxidation/injection, permeable reactive barriers, treatment blankets, environmental fracturing, groundwater circulating wells, directional wells, carbon substrate injections, electrokinetic-enhanced remediation; evapotranspiration covers.

VII. In-Situ Physical/Biological Treatment

Bioremediation, monitored natural attenuation, enhanced bioremediation (e.g., electrokinetic, propane sparging, enhanced reductive de-chlorination), bio-sparge, phytoremediation.

VIII. Ex-Situ Physical/Chemical Treatment

Air stripping, granular activated carbon (GAC), pump & treat, advanced oxidation, multi-phase extraction, catalytic oxidation.

IX. Ex-Situ Physical/Biological Treatment

Bioreactors, biopiles.

X. In-Situ and Ex-Situ Thermal Treatment

Thermal desorption, incineration, self-sustaining smoldering (star technologies), electrical resistance heating, thermal conduction heating, steam enhanced extraction.

XI. Per- and Polyfluoroalkyl Substances (PFAS) Treatment

Conventional water/wastewater treatment (activated carbon, ion exchange resin, membrane separation, incineration), sorption technology, advanced oxidation/reduction, others.

XII. Alternative Technologies/Post Remediation Strategies

Micro and Nanotechnologies, engineering controls, institutional controls, alternative land reuse, remediation process optimization, subsurface imaging technologies, risk management, Drones/Robots/Artificial Intelligence (AI)/Satellites for monitoring of remediation systems; others.

ASSIGNMENTS

Services will be requested for an assigned project and will be in accordance with a cost proposal submitted and approved at that time. The Professional is expected to have the costs of all required activities needed to complete the assignment.

Individual project assignments will be based on a written Statement of Objectives provided by the State and a proposal from the Professional to perform the scope of work. It is anticipated the assigned work will be completed before the expiration date of the Contract. However, assignments made during the period of the Contract may include work that will continue after the end date of the Contract period. A typical scope of work may address one or more of the following phases of the project:

I. Remedial investigation
II. Feasibility study
III. Remedial Design
IV. Construction Oversight
V. O&M of remediation systems/oversight of O&M services
VI. Long term monitoring

Any subsequent work may not be assigned until the results of the previous phase are realized and there is enough information to establish a new statement of objectives. At the sole discretion of the State, the State may assign subsequent work to the same Professional, if deemed necessary, and the firm performed well on the previous work. If the State determines there is an imminent endangerment of human health or the environment, design of an emergency abatement system may be assigned under the Contract.

For some federally funded projects, whether in part or whole, a complete and accurate EPA Optional Form 5700, commonly called an OF-60, will be required as part of the project proposal Any Contract augmentation must also be accompanied by an OF-60. All changes, whether increases or decreases, and even situations where the budget dollars remain the same but tasks within the different categories of the OF-60 have shifted, must be reflected by an accurate, updated OF-60. The only time a new OF-60 would not be necessary is when the total dollar amount stays the same and the fees and other categories on the OF-60 stay the same.

DISPOSAL OF WASTE

Any wastes generated during the performance of work under this Contract must be disposed of in conformance with all applicable state and federal laws, rules, and/or regulations. For all wastes being disposed under this Contract, it is the responsibility of the Professional to ensure compliance with this directive.

The Professional shall sign waste manifests on behalf of the State attesting to the accuracy and completeness of the manifest, when requested, at sites for which they are performing oversight. The State will retain generator status for these wastes. If necessary, the State will provide a letter to the Professional conveying this authority.

The Professional shall properly dispose of any samples they retain during site work upon written permission from the Agency Project Manager. Disposal of samples is not a billable expense but may be included in the Professional’s overhead.

ENVIRONMENTAL DRILLING

The Professional shall competitively bid environmental drilling work to at least three (3) drilling contractors for each drilling assignment unless the Professional can demonstrate to the Agency Project Manager's satisfaction that there is only one qualified firm who can adequately perform the work as specified. If the Professional determines the services of a specific drilling firm are required, the Professional must state those reasons in writing to the Agency Project Manager for concurrence. The written request will address cost effectiveness, time constraints, geologic situations, and drilling methodologies.

The format and process used for bidding will be in accordance with industry standards and based upon a method chosen by the Professional that is most advantageous to the State. The frequency of bidding necessary within one project assignment will be decided upon between the Professional and the Agency Project Manager. Copies of all bid documents will be provided to the Agency Project Manager. Costs incurred by the subcontractor for environmental drilling shall be billed to the State as a reimbursement.

Ineligible Costs - The Professional cannot bill the State for the drilling subcontractor's time to develop work plans, prepare bid specifications for work plans, or to attend site safety meetings.

Billing Rates - If a drilling subcontractor provides other technical services such as geophysical testing, then the Professional must submit billing rates, fees, resumes, wages, and salary ranges for that Subcontractor.

Downtime for Equipment and Supplies - The Agency Project Manager has the option to purchase supplies and equipment. If the State purchases equipment for use at a site, the State is responsible for that equipment and may need to compensate the Professional for downtime or demobilization costs if the equipment does not function properly. If the Professional furnishes supplies and equipment that do not function properly and causes downtime, the State will not compensate the Professional for the downtime. Also, the State will not reimburse the Professional for backup supplies and equipment. The State will only reimburse the Professional for supplies and equipment used at the site or that must be available as indicated specifically by the health and safety or work plan.

LABORATORIES

The Professional may be required to obtain samples, prepare them for shipping, ship, and pick up samples or any other activity associated with sample collection and interpretation as determined necessary by the Agency Project Manager.

All laboratory analyses shall be performed by the EGLE lab, unless the Agency Project Manager approves use of a current ISID Environmental Laboratory contract holder, an EPA - CLP lab, or another lab as deemed necessary by the State. If a private lab, other than an ISID State Contract Lab, is to be used to perform the analyses, prior written permission by the Agency Project Manager is required. The private lab must report data in a format consistent with the format used by the State and must include the same level of detail regarding QA/QC documentation and chain of custody records.

EQUIPMENT AND SUPPLY PURCHASES AND RENTAL PROCEDURES

Certain Agency procedures may apply to equipment, supplies, surveys, and other items as specified by the Project Director/Agency Project Manager and will be treated as reimbursements or Other Direct Costs (ODCs). Computers and computer related materials may be included as part of such procedures; however, prior written approval from the Department regarding computers and software must be secured.

If an item will be consumed or would be expected to be rendered unusable during the project assignment, then renting is not a viable alternative and purchasing the item is necessary. Examples of consumption are bags of cement and installed casing. Examples of items expected to be rendered unusable are Tyvek suits and disposable bailers. If the rental price or price of using the Professional's equipment exceeds the purchase price the item shall be purchased.

If renting is an option, the cost shall be based upon the expected time of usage of that service or equipment or supply. The rental charge or charge for the Professional's equipment shall include maintenance, calibration, parts replacement, and service charges for the equipment.
A table recording the costs incurred to date to rent equipment, or to use the Professional's equipment, shall be included in each monthly progress report. This table shall also include the purchase price for each piece of equipment. Each item required for the project shall be listed separately.

At the end of the project, the State has the OPTION to accept ownership of a purchased piece of equipment.

If an assignment must be modified to provide for additional scope of work, the cost effectiveness of purchasing, renting, or using the Professional's equipment must be determined for the additional work.

All deposit charges will be paid by the Professional and will not be reimbursed by the State.

HEALTH AND SAFETY PLANS (HASPs)

The nature of the work to be performed under this Contract is hazardous. In addition to HASP requirements noted in the Phase/Task section of the Contract the following will also apply:

The Professional shall satisfy **29 CFR 1910.120** and Section 24 of Act 154 PA 1974 as amended and corresponding rules and all federal, state, and local statutes, regulations, ordinances, etc., regarding health and safety **(40 CFR 35.6055(b)). Prior** to executing any work at the assigned site, the Professional shall develop and submit all HASPs for the site to the Agency Project Manager for review, acceptance, and inclusion into the work plan.

The Professional shall arrange for all its employees that will be working on a contaminated site to attend a health and safety training course, and/or a personnel protection course. The Professional is responsible for all costs related to the training. When requested by the State, the Professional must provide proof of completion of health and safety training for each employee working on a site prior to the employee entering the site for any purpose.

The Professional will ensure that employees and sub-consultant's/subcontractor's employees wear protective clothing and use equipment specified in the site HASP, at all times, that the employee is on the site.

Health and Safety Training and Medical Monitoring are not considered reimbursable items under this Contract. When working in any level of safety equipment, the level itself does not dictate additional costs, but the equipment costs above Level D are reimbursable.

INVOICING AND PAYMENT PROCEDURES

Documentation for payment will be submitted monthly per the requirements in the Contract. Project costs will be reimbursed to the Professional on an as-incurred basis in accordance with the terms of the Contract for Professional Services. Invoices received covering service periods for which the progress reports have not been received by the State will not be processed until the progress reports are received. These will be considered incomplete invoices.

Each invoice that includes labor will include a one-page summary sheet that lists by date the name of the individual providing the professional service, the individual's position/classification, hours worked that day, and hourly billing charge. Each invoice that includes reimbursable expenses will include a one-page summary with the following categories: *Meals, Lodging, Travel, Shipping, Equipment Rental, Field Supplies/Equipment Purchase, sub-consultants, and Miscellaneous*. Under Meals and Lodging categories, the date, name of the individual and total daily cost will be included. Under Travel category, the Professional will include the date, name of the individual, total mileage (above the allowed amount specified in the Contract), mileage rate, and total daily cost. Under Shipping, the Professional will include the date shipped, description of item shipped (e.g., tech memo, etc.) and the cost to ship the item. Under Equipment Rental, the Professional will include the range of dates equipment rented, description of equipment rented and rental cost. Under Field Supplies/Equipment Purchase and Miscellaneous categories, the Professional will include the date purchased, description and purpose of the item purchased and the cost. Under sub-consultants/subcontractors, the Professional will list the date of the sub-consultant/subcontractor work, name of the sub-consultant/subcontractor, description of work conducted, and the cost. The cost for each category will be totaled.

Contract Close-Out – Final payment shall be withheld until all deliverables have been received and accepted by the State. In addition, the Professional will be required to submit to the Agency Project Manager, an unconditional waiver, signed by an authorized representative of each sub-consulting/subcontracting firm, used on the project, indicating that they have been paid in-full by the Professional for all work performed.

LITIGATION SUPPORT

The Professional's personnel and the personnel of its sub-consultants/subcontractors will be required, if requested by the Agency Project Manager on behalf of EGLE's attorneys, to provide assistance to the State in the form of participation in legal actions against alleged responsible parties for violation of state and/or federal environmental law or the recovery of public expenditures regarding any of the operations the Professional or its sub-consultants/subcontractors are involved in under this Contract. This assistance may include, but is not limited, to the preparation of reports and assisting state and/or federal attorneys in preparation of the government's case, including the preparation and execution of interrogatories, affidavits, and testimony as a fact witness.

The State will reimburse the Professional for such assistance as described above at the contractually approved rates for the Professional's personnel at the time services are required. The Professional shall insert an identical obligation to provide such assistance in all sub-consultants/subcontractor agreements to perform work under this Contract. Failure to meet the requirement of this section shall be considered a breach of this Contract.

In addition, the Professional agrees that upon the Agency Project Manager request on behalf of the State attorney, that the Professional's personnel or the personnel of its sub-consultants/subcontractor will appear at trial as an expert witness. If expert testimony is requested, the Professional and State mutually agree while the State cannot, due to Section 2164 of the Revised Judicature Act, guarantee to pay the Professional's personnel any sum in excess of the current per day expert witness fee, the State attorney may ask the court to permit the State to pay the Professional's personnel for the appearance as an expert witness on behalf of the State, at a rate equal to the rate of the employee's contractually approved rates at the time services are required, for the actual time of court appearance plus travel time and standard expenses as defined in the Contract. To the extent that the court grants such a request, the Professional agrees to reimbursement at such rates.

1. If the Professional receives a subpoena or if an Assistant Attorney General assigned to the site requests information regarding one of the Professional's assignments, the Professional may release that information without the Agency Project Manager's prior written permission. However, the Professional must provide, in writing, to the Agency Project Manager a letter documenting what information has been released, to whom and when. Any other requests to release information continue to require the Agency Project Manager prior written permission. The party requesting the information has an obligation to pay for any copying costs. If the State requests duplicate copies, the State will reimburse the Professional for copying costs.

2. If a party other than the State requests the Professional provide testimony regarding an assignment for which they have performed work under this Contract, either through deposition or testimony in court, the State will NOT reimburse the Professional for that testimony. Depositions or testimony requested by parties other than the State are not covered by this Contract, and payment for a deposition or testimony may be prohibited by MCL 600.2164.

3. If a State Assistant Attorney General requests the Professional assist in preparation for litigation, i.e., answering interrogatories, preparing for trial via interviews, and discussions concerning the site, this time is reimbursable under this Contract.

PROJECT CONTROL REPORTS AND DELIVERABLES

1. Deliverables

   The Professional shall provide electronic copies of all final reports, plans, specifications, drawings, and other significant deliverables in Microsoft Word, Excel, and AutoCAD, as applicable, as well as in separate PDF format, provided on one (1) portable media device. In addition, the Professional shall provide one unbound, reproducible copy of each deliverable for each of the assigned projects, as requested or as specified in the assigned project scope of work. The Department/Agency will be responsible for obtaining access to the assigned sites, providing a map for the assigned sites, and where applicable, previous investigation/analytical results for work conducted at the assigned sites.

2. Project Control

   A. The Professional will carry out the assignments under this Contract under the direction of the Project Director and/or the Agency Project Manager.

B. The Professional will submit brief written monthly (or any other interval deemed necessary by the State) progress reports that outline: the work accomplished during the reporting period including basis for significant decisions; work to be accomplished during the subsequent reporting period; daily field activity logs; problems, encountered or anticipated; notification of any significant deviation from the approved work plans; and budget/expenditure information including: project budget, cumulative expenses, projected expenses, and explanations of budget deviations for each major task. Staff time and costs to correct errors, omissions, and deficiencies in the work are not reimbursable. The Agency Project Manager may adjust the frequency of reports depending upon the nature of the project or phase of a particular project.

3. Reports

All project reports required as deliverables to this Contract will begin with an Executive Summary. This will briefly outline the conditions encountered at the site, work performed at the site, conclusions drawn from this work, a list of the recommended alternatives for site remediation (where applicable), and a short description of any specifications prescribed by the report. The Executive Summary will be a synopsis of all information presented in the report and organized in logical manner to present an overview of the specific report. Each assignment will require specific reporting requirements. The following are examples of reports that may be required from the Professional:

A. Monthly progress reports.

B. Draft and Final Preliminary Site Investigation Work Plans and assessment reports

C. Draft and Final FS/RI Work Plans and reports

D. RI technical memoranda for groundwater sampling, soil gas sampling, surface water sampling, soil/sediment sampling, air quality sampling, and site hazards assessment. The technical memoranda should summarize the data and collection techniques and include an evaluation of the data.

E. Daily field logs which include equipment and supply charges and personnel on site. These shall be maintained and attached to the corresponding monthly-progress reports.

The following tasks may be required to produce reports/work products listed above:

- Community Relations
- FS (including Risk Assessment)
- Natural Resource Damage Assessment (NRDA)
- UST removal/closure and other Related Work
- Potentially Responsible Party (PRP) Identification
- Preliminary Site Investigation
- Risk-Based-Corrective-Action Activities
- RI and recommendations
- Baseline Environmental Assessments Review
- Contract Transition Tasks

All draft documents and communications with the State regarding guidance, input, acceptance, and approval shall be marked “DRAFT” and “Deliberative Process – FOIA Exempt”. Information so designated shall not be provided in response to a Freedom of Information Act (FOIA) request.

4. The Professional and/or its sub-consultants/subcontractors shall follow the current edition of ASTM Standard D 5299-92 (Standard Guide for Decommissioning Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities) and other guidance as provided by the State as a performance standard for monitoring well, soil boring, and vadose zone monitoring device abandonment.

5. The Professional and/or its sub-consultants/subcontractors shall enter a record in Wellogic or designated State database program, for each well installed or abandoned under this Contract. The State may choose to require submittal of a paper record for well construction diagrams and/or well abandonments in lieu of submitting an electronic record.

SELECTION CRITERIA

Responses to this RFP will be evaluated based upon the technical merit, conciseness, clarity, creativity. thoroughness of the proposal, understanding of the project, and contract requirements. In addition, the following specific factors will be evaluated as presented in the Professional’s submitted proposal for the primary list selection:

A. Technical Qualifications – 100 points
   1. Business Organization – 5 points possible
   2. Past Performance/Environmental Experience – 25 points possible
   3. Regulatory Knowledge – 15 points possible
   4. Personnel Staffing – 25 points possible
   5. Sub-consultants/subcontractors – 10 points possible
   6. Special Factors – 5 points possible
   7. Sampling and Laboratory Analysis Experience – 5 points possible
   8. Health and Safety – 5 points possible
   9. Quality Assurance/Quality Control – 5 points possible

B. Price Analysis – 100 points
   1. Professional Billing Rates – 75 points possible
   2. Billing Rate Increase – 25 points possible

Depending on available funding for cleanup activities, the State anticipates awarding contracts to one or more Professionals receiving the highest scores in the evaluation. The State reserves the right not to award the contract(s) or award contract(s) to one or more firms for the submitted proposals. The State may reject proposals in whole or in part and may waive any informality or technical defects if, in the judgment of the selection committee, the best interest of the State will be served.

Note: *In addition to the above selection criteria and to select the firm for a marked remediation technology, separate evaluations of qualifications and experience will also be conducted for each of the remedial technologies identified previously in this RFP.*

ATTACHMENT II

Professional Questionnaire

Professional Questionnaire
Department of Technology, Management and Budget
2023 ISID Expanded Environmental Remediation RFP
Professional Environmental Consulting Services

INSTRUCTIONS: This questionnaire aims to collect information regarding the Professonals general capability to provide the type of work requested in this RFP. Specialized technology specific information should be provided in the 'specialized technologies questionnaire' a sample of which is provided in Attachment IV. Professionals shall complete the following required information in the fillable form provided. A separate sheet may be used if additional space is needed. The Article number(s) relating to the additional information must be included on the separate sheet, if used. Professionals are to ensure all questions are answered completely and concisely to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name:_____

Business Organization Address:_____
Telephone and Fax:_____
Website and E-mail:_____
ISID Contract Contact Person Name & E-Mail:
Professional(s) SIGMA Vendor ID number(s): _____
If Applicable, state the branch office(s), partnering organization or other subordinate element(s) that will perform, or assist in performing, the work:_____

1.2 Check the appropriate operation status:
☐ Individual ☐ Association ☐ Partnership ☐ Corporation, or ☐ Combination – Explain:
_____

1.3 If operating as a corporation, include the state of incorporation (_____) and the date of incorporation (____).

1.4 Include a brief description of Professional's business history:_____

1.5 Professional(s) federal I.D. number: _____

ARTICLE 2: PRIOR EXPERIENCE

2.1 Identify the project types and professional services for which your firm is exceptionally qualified and experienced.

- ☐ Excavation, Dewatering and Off-Site Disposal
- ☐ Demolition
- ☐ Migration Control, Fluid Removal, and Containment
- ☐ Landfills
- ☐ Indoor Air/Vapor Intrusion
- ☐ In-Situ Physical/Chemical Treatment
- ☐ In-Site Physical/Biological Treatment
- ☐ Ex-Situ Physical Chemical Treatment
- ☐ Ex-Situ Physical/Biological Treatment

- ☐ In-Situ and Ex-Situ Thermal Treatment
- ☐ Per-and Polyfluoroalkyl Substances (PFAS) Treatment
- ☐ Alternative Technologies/Post Remediation Strategies

2.2 Provide client references and brief descriptions for at least three (3) projects in the last five years closely related to the work requested in this RFP. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided RI/FS services

Project 1 Reference Information:

Project Name:_____
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name:_____
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name:_____
Key Personnels:_____
Project Address:_____
Project City/State/Zip_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

2.3 A sample of field activity logs detailing a 1-week period (from one of the three (3) prior experience sites) and a weekly report provided? ☐Yes ☐No

ARTICLE 3: ENVIRONMENTAL EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas:

3.1 Remedial Investigations:_____

3.2 Sampling and Laboratory Analysis:_____

3.3 Feasibility Studies:_____

3.4 Site Closure:_____

3.5 Health and Safety:_____

3.6 UST Removal and Closure:_____

3.7 Quality Assurance/Quality Control:_____

ARTICLE 4: REGULATORY KNOWLEDGE

Include a brief description of your firm's professional experience in each of the following:

4.1 Michigan environmental statutes related to remedial investigation/action:_____

4.2 Federal regulations and environmental statutes related to remedial investigation/action:_____

ARTICLE 5: PERSONNEL STAFFING

5.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project provided? ☐Yes ☐No

5.2 Complete the following information regarding the personnel your firm considers key to the successful completion of the study or project scope of work:

Key Personnel 1
Name:_____ Job Title:_____
Labor Classification:_____ College Degree(s):_____
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 2
Name:_____ Job Title:_____
Labor Classification:_____ College Degree(s):_____
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 3
Name:_____ Job Title:_____
Labor Classification:_____ College Degree(s):_____
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 4
Name:_____ Job Title:_____
Labor Classification:_____ College Degree(s):_____
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 5
Name:_____ Job Title:_____
Labor Classification:_____ College Degree(s):_____
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☐Yes ☐No

5.3 Do the Professional Project Managers (PM) have at least three years experience as a PM? ☐Yes ☐No

5.4 Do the Professional PMs have a minimum of 10 years experience with similar projects? ☐Yes ☐No

5.5 Resumes for the key personnel provided? ☐Yes ☐No

ARTICLE 6: SUB-CONSULTANTS/SUBCONTRACTORS

6.1 Identify any consultants/subcontractors that will provide services, including engineering, well drilling, and geophysical testing services. *(Note: If any support must be provided by a consultant/subcontractor, the consultants/subcontractors must indicate their capability and willingness to conduct the work)*:

Sub-Consultant/Subcontractor 1
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

6.2 Are consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

6.3 If a consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

6.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work requested in this RFP for each consultant/subcontractor:

Project 1 Reference Information:
Project Name:_____
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:
Project Name:_____
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:
Project Name:_____
Key Personnels: _____
Project Address:_____

Project City/State/Zip: _____

Owner/Client Contact Name and Telephone #: _____

Project 3 Description: _____

ARTICLE 7: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. (As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications).

_____

ATTACHMENT III

GUIDELINES FOR POSITION CLASSIFICATIONS

GUIDELINES FOR POSITION CLASSIFICATIONS

The Professionals are required to use the following guidelines as the basis for classification of personnel to be assigned under their contracts. Changes in the key personnel under the contract must be done by Contract Modification. In addition, the Professionals must provide with their modification requests the names, hourly billing rates, and resumes for the new **Key Personnel** to be added to the contracts. A Key Personnel is any staff member of the Professional who is essential for the successful completion of the Project scope of work and authorized to make decisions affecting the work at the sites under the contracts.

1. **PROFESSIONAL KEY PERSONNEL**

A. **Level 4** (P4) - Plans, conducts and supervises projects of major significance, necessitating proven managerial skills and knowledge of hazardous waste sites. Must demonstrate ability to originate and apply new and/or unique methods and procedures. Supplies technical advice and council to other professionals. Generally operates with wide latitude for independent action.

Typical Title: National Manager, Project Leader, Chief Engineer, or Scientist.

Qualifications and Experience:
Ph.D. degree with 10 years or more experience.
MS degree with 12 years or more experience.
BS degree with 14 years or more experience.

Experience Factors: Technical experience in discipline directly related to the requirements of this contract. Minimum of 4 years experience in supervising multidisciplinary professionals and general office management including budgetary requirements.

B. **Level 3** (P3) - Under general supervision of P4 Manager, plans, conducts and supervises assignments on a project-by-project basis. Estimates and schedules work to meet completion dates. Directs assistance, reviews progress and evaluates results; makes changes in methods, design or equipment are made where necessary. Responsible for safe and cost-effective approaches to achieve the objectives of the project.

Typical Title: Regional Team Leader, Project Engineer.

Qualifications and Experience:
Ph.D. degree with 4 to 10 years experience
MS degree with 6 to 12 years experience
BS degree with 8 to 14 years experience

Experience Factors: Technical experience in disciplines directly related to the requirements of this contract. Minimum of 4 years experience or equivalent. Must have demonstrated ability to manage group of interdisciplinary professionals.

2. PROFESSIONAL NON-KEY PERSONNEL

A. **Level 2** (P2) - Under supervision of a senior or project leader, carries out assignments associated with projects. Work assignments are varied and require some originality and ingenuity. Applies training of professional discipline to assigned projects and translates technical guidance and training received into usable data products and reports. Evaluates data associated with various watersheds for use in developing digital flood insurance map production and development of updated flood data.

Typical Title: Surveyor, Engineer, Construction Manager, Project Manager, Scientist, Analyst

Qualifications and Experience:
MS degree with 2 to 6 years experience.
BS degree with 3 to 8 years experience.

Experience Factors: Minimum of 2 years in area directly related to contract requirements.

B. **Level 1** (P1) - Entry level for professional classification; works under supervision of team or project leader. Gathers and correlates basic data and performs routine tasks and other duties as assigned. Makes recommendations on work assignments and on variables which affect field operations. Assists field operations as directed, including manual tasks of equipment setup and maintenance. Performs other duties as assigned.

Typical title: Junior Associate (Surveyor, Engineer, Scientist, Geologist, etc.)

Qualifications and Experience:
MS degree with 0 to 2 years experience.
BS degree with 0 to 3 years experience.

Experience Factor: None

3. TECHNICIAN NON-KEY PERSONNEL

A. **Level 3** (T3) - Performs non-routine and complex assignments. Works under general supervision of a surveyor, scientist or engineer. Performs experiments or tests which may require non-standard procedures and complex instrumentation. Records, computes and analyzes test data, prepares test reports. May supervise lower level technicians or trades personnel.

Typical Title: Senior Technician

Qualifications and Experience:
6 years or more experience.

Experience Factor: Related to scope of contract.

B. **Level 2** (T2) - Performs non-routine and complex tasks in addition to routine assignments. Works at the direction of the team or project leader. Gathers and correlates basic data and performs routine analyses. May also perform experiments or tests which may require non-standard procedures and complex instrumentation. May construct components or sub-assemblies or prototype models. May troubleshoot malfunctioning equipment and make simple repairs as authorized by team or project leader.

Typical Title: Senior Technician

Qualifications and Experience:
Two to six years experience or equivalent.

Experience Factor: Related to scope of contract.

C. **Level 1** (T1) - Entry level; performs simple, routine tasks under supervision as established in chain-of-command procedures. Performs routine maintenance and may install, set up or operate field equipment of moderate complexity. Provides a wide variety of support functions during field operations.

Typical Title: Junior Technician (field technician)

Qualifications and Experience:
0 to 2 years experience.

Experience Factor: None

4. TECHNICAL SUPPORT (TS) NON-KEY PERSONNEL

Performs project specific technical support work such as spreadsheet preparation, data entry, etc.

Typical Title: Project Assistant, Data Entry Clerk, etc.

Qualifications and Experience:
0 to 2 years or more

ATTACHMENT IV

Specialized Technology Questionnaire

Specialized Technology Questionnaire
Department of Technology, Management and Budget
2023 Expanded Environmental Remediation ISID RFP
Professional Environmental Consulting Services

Remediation Technology:

(submit one form for each specific technology below).
Note: The below list will be a drop-down form in the fillable form

- ☐ Excavation, Dewatering and Off-Site Disposal
- ☐ Demolition
- ☐ Migration Control, Fluid Removal, and Containment
- ☐ Landfills
- ☐ Indoor Air/Vapor Intrusion
- ☐ In-Situ Physical/Chemical Treatment
- ☐ In-Situ Physical/Biological Treatment
- ☐ Ex-Situ Physical/Chemical Treatment
- ☐ Ex-Situ Physical/Biological Treatment
- ☐ In-Situ and Ex-Situ Thermal Treatment
- ☐ Per- and Polyfluoroalkyl Substances (PFAS) Treatment
- ☐ Alternative Technologies/Post Remediation Strategies

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name:_____

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information

Project Name: _____

Project Address:_____

Key Personnel:_____

Project City / State / Zip:_____

Contact Name / Phone Number / Email Address:_____

Project Description:

Project 2 Reference Information

Project Name: _____

Project Address:_____

Key Personnel:_____

Project City / State / Zip:_____

Contact Name / Phone Number / Email Address:_____

Project Description

Project 3 Reference Information

Project Name: _____

Project Address:_____

Key Personnel:_____

Project City / State / Zip:_____

Contact Name / Phone Number / Email Address:_____

Project Description

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:_____

3.2 Construction Oversight:_____

3.3 Remedial O&M:_____

3.4 Site Closure:_____

3.5 Soil Erosion and Sedimentation Control:_____

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☐Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology:

Key Personnel 1

Name:_____

Job Title:_____

Labor Classification:_____

College Degree(s):_____

Has this individual successfully completed 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up to date 8 hour HAZWOPER refresher training?

☐Yes ☐No

Key Personnel 2

Name:_____

Job Title:_____

Labor Classification:_____

College Degree(s):_____

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 3

Name:_____

Job Title:_____

Labor Classification:_____

College Degree(s):_____

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 4

Name:_____

Job Title:_____

Labor Classification:_____

College Degree(s):_____

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? ☐Yes ☐No

Key Personnel 5

Name:_____

Job Title:_____

Labor Classification:_____

College Degree(s):_____

Has this individual successfully completed 40-hour HAZWOPER training with an up to date 8-hour HAZWOPER refresher training? ☐Yes ☐No

4.3 Do all the Professional Project Managers (PM) have at least three years experience as a PM?

☐Yes ☐No

4.4 Do all Professional PMs have a minimum of 10 years experience with similar projects?

☐Yes ☐No

4.5 Are resumes for all key personnel provided? ☐Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3
Business Name:_____
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Sub Consultant / Subcontractor Project 1 Reference Information

Project Name: _____

Project Address:_____

Key Personnels:_____

Project City / State / Zip:_____

OwnerContact Name / Phone Number / Email Address:_____

Project Description:

Sub Consultant / Subcontractor Project 2 Reference Information

Project Name: _____

Project Address:_____

Key Personnels:_____

Project City / State / Zip:_____

Owner Contact Name / Phone Number / Email Address:_____

Project Description

Sub Consultant / Subcontractor Project 3 Reference Information

Project Name: _____

Project Address:_____

Key Personnels:_____

Project City / State / Zip:_____

Owner Contact Name / Phone Number / Email Address:_____

Project Description

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. that would pertain to this RFP. (As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications).

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Certification of a Michigan Based Business

(Information Required Prior to Contract Award for Application
of State Preference/Reciprocity Provisions)

To qualify as a Michigan business:

Vendor must have, during the 12 months immediately preceding this bid deadline:
or
If the business is newly established, for the period the business has been in existence, it has:

(Check all that apply):

- ☐ Filed a Michigan single business tax return showing a portion, or all the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL • ˜208.1 – 208.145: or

- ☐ Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or

- ☐ Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

- ☐ Bidder qualifies as a Michigan business (provide zip code: _____)

- ☐ Bidder does not qualify as a Michigan business (provide name of State: _____).

- ☐ Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: _____)

Bidder: _____

_____
Authorized Agent Name (print or type)

_____
Authorized Agent Signature & Date

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN $25,000 and subject to debarment under MCL 18.264.

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Responsibility Certification

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.

(b) Has not had a felony conviction in any state (including the State of Michigan).

(c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid rigging, or a violation of state or federal anti-trust statutes.

(d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

(e) Has not been terminated for cause by the Owner.

(f) Has not failed to pay any federal, state, or local taxes.

(g) Has not failed to comply with all requirements for foreign corporations.

(h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.

(i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:

i. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.

iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the period required.

iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).

v. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.

vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.

vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).

(j) Is NOT an Iran linked business as defined in MCL 129.312.

I understand that a false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

Bidder: _____ _____

Authorized Agent Name (print or type)

_____

Authorized Agent Signature & Date

☐ I am unable to certify to the above statements. My explanation is attached.

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

ACKNOWLEDGMENT OF ADDENDUMS

PSC acknowledges receipt of Addenda: No. ___ dated: _____,

No. ___ dated: _____ No. ___ dated: _____

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design and Construction Division

REQUEST FOR PROPOSAL
ADDENDUM NO. 1

This form identifies an Addendum to a Request for Proposal for Professional Services, and incorporates interpretations or clarifications, modifications, and other information into the Request for Proposals. Addenda will be numbered by the Project Director and distributed through SIGMA Vendor VSS as an attachment.

TO: ALL PROPOSERS	DATE ISSUED April 13, 2023
PROJECT NAME 2023 Expanded Environmental Remediation ISID	FILE NUMBER N / A
PROJECT DIRECTOR Sadi Rayyan	PROPOSAL DUE DATE: May 4, 2023

ADDENDUM ITEMS: (attach additional sheets and drawings if required)

Please acknowledge receipt of this Addendum in your proposal.

Questions

The following questions have been compiled to clarify answers to questions in portions of the RFP package:

Q1. **Section III-1 states, "no mark-up of the sub-consultants' fees or billing rates will be allowed, including drilling, laboratories, remediation firms." Is this correct, that the winning consultant will be allowed to bill for overhead administrative, US mail regular shipping costs, paper copies, and hour billing rates, only, and no subcontractor mark-up?**

A1. *Yes. No mark-up will be allowed for subcontracted services or other allowable reimbursable expenses (i.e., equipment, PPE, travel expenses, etc.).*

Q2. **Are fillable forms going to be available for Attachment II (Professional Questionnaire – pg. 33 of RFP) and Attachment IV (Specialized Technology Questionnaire – pg. 44 of RFP)?**

A2. *Yes. The forms are posted under "Attachments" as Questionnaire Part I Fillable (2023).docx and QuestionnairePart II Fillable (2023).docx.*

Q3. **In Attachment II (Professional Questionnaire) should we include three (3) project references for each project type we are submitting for, or just three (3) project references in total?**

A3. *For Attachment II – Professional Questionnaire, three (3) project references in total. Three references per technology are to be provided on the Specialized Technology Questionnaires.*

Q4. In Attachment IV (Specialized Technology Questionnaire), it is requested to submit at least three (3) project references for each project type that we are submitting for. If three (3) references are requested in Attachment II for each project type, can these references be the same and referenced as such in our response document?

A4. See A3 above. For Attachment IV – Specialized Technology Questionnaire, submit three (3) project references for each selected technology.

Q5. Will the State allow firms to submit bids as both a prime contractor and as a supporting subcontractor for another prime contractor? If the answer to the previous question is yes, please confirm that there will not be any reduction in points during the evaluation phase if bidders use subcontractors that are also bidding as prime contractor.

A5. No.

Q6. The Summary section of the Scope of Work in the RFP indicates " Experience with projects located in Michigan is preferred", if project examples provided are not within Michigan will points be deducted?

A6. No.

Q7. Is the 6MB upload limit for total upload volume or per file? Is there a limit to the number of files that can be uploaded?

A7. The 6MB upload limit is per file. There's no limit to the number of files that can be uploaded but number of files should be as minimum as possible.

Q8. Page 26 "Environmental Drilling" indicates that "The Professional shall competitively bid environmental drilling work to at least three (3) drilling contractors for each drilling assignment". Is it necessary to present 3 drilling subcontractors in section 6.1 of the questionnaire? Can other subcontractors be considered in the future when proposing on future ISID projects or are they limited only to those subconsultants, and subcontractors presented as part of this proposal?

A8. No. Drilling subcontractors are not needed at this time but will be needed for future assignments. However, if a subcontractor or drilling contractor is to provide consulting services along with your staff, then their qualifications and billing rates should be presented. This requirement is intended for sub-consultant(s) who will supplement your services as a professional firm.

Q9. Section IV (Page 10) - The RFP requests separate hourly billing rates for all subcontractors. Does this also include other subs like drillers, demolition/excavation firms, landscapers etc.? Do these subconsultants also need to include rates for materials and equipment?

A9. See A8 above. This RFP is for professional services. Do not include subcontractors that provide non-professional services, such as drilling subcontractors.

Q10. Can a Professional Services Contractor submit an EER Contract proposal as the primary service provider and be listed as a sub-consultant on another PSC's contract proposal?

A10. No. See A5 above.

Q11. Based on the text in Section II Proposal Format – Part 1 – Technical Proposal Is a separate narrative for Part 1 required or is the Professional Questionnaire designed to address Part 1?

A11. Yes. You need to submit the completed questionnaires in addition to your written proposal as specified. However, some of the requirements in the RFP may not be applicable to this ISID RFP response. For each technology selected by your firm, you'll need to provide the necessary information to convince the committee members that you have the adequate resources and experience to complete an assigned project effectively and successfully under the checked technology.

Q12. Section 2.2 of the Professional Questionnaire requires "client references and brief descriptions for at least three (3) projects in the last five years closely related to the work requested in this RFP." Are three references required per each project type and service listed in the prior section? (Three references per technology will be provided in the Specialized Technology Questionnaires)

A12. See A3 above. Three references per technology to be provided under the Specialized Technology Questionnaires.

Q13. In the primary questionnaire Part 1, section 2.2 Project Reference and Section 5.2 Personnel, it asks for Project References and Key Personnel and then again in the questionnaire Part 2 for each of the technologies. Do you want the information in both places, or can it just be provided in Part II (section 4.2 and 5.4) with each of the Remediation Technologies?

A13. See A3 and A12 above. The Project References chosen for Part I might be different from the Project References chosen for each technology. Provide the requested information for each project reference.

Q14. Can a firm be qualified for an ISID Contract by submitting only Part I?

A14. No.

Q15. Are any terms of this (sample) contract negotiable, including, but not limited to, subjects of Indemnification, defend and hold harmless, and limitation of liability?

A15. No.

Q16. In the sample contract provided, it states, "During the Construction Administration Services Phase of the Project, the Professional is required to complete and submit, the on-site inspection record form, "DTMB-0452, The Professional's Inspection Record," for all on-site inspection visits to the Project site" Where can we find this form to review? It is not available on the DTMB Design & Construction Forms website.

A16. Attached.

Q17. Should the technical proposal and cost proposal be submitted via Sigma as one file or two separate files?

A17. One file. However, Part I and Part II should be clearly identified and separated from each other.

Q18. Will DTMB be amenable to receiving and negotiating modifications to the sample contract?

A18. No. See A15 above.

Q19. Could you please clarify what is meant by "chronological resumes" in section II-3 Personnel?

A19. List work experiences and achievements starting from the most recent one and following up with previous ones below.

Q20. If personnel for Part I and Part II overlap, would you prefer dividers that separate out staff for each technology, even if their resume is also included for Part I? In other words, there may be resumes in Part I and duplicated for a Technology in Part II.

A20. Include all resumes in a single appendix and provide the appendix in Part I.

Q21. On the Experience Summary forms, can the line items below be changed to be more appropriate to the task?

Designed
Construction Oversight
O & M
Closed
Used Treatment Train

A21. No.

Q22. Is a 2023 ISID Expanded Environmental Remediation Experience Summary Form needed for each box checked in the Components/Technics section of the form or is it just one form per Remediation Technology.

A22. One experience summary form per each selected technology.

Q23. Article 6 of the Part 1 Questionnaire requests information and project descriptions for drilling consultant/subcontractor. Do we need to include this information for subcontractors that provide non-professional services, such as drilling?

A23. No. See A9 above.

Q24. Section I-9 of the RFP ("Proposals") states "when uploading, your attachment(s) the attachment must be 6mb or less." This limit is not practical for bidder's submitting on many or all of the remedial technologies. Can bidder's proposal consist of more than one attachment, each being less then 6mb?

A24. Yes. See A7 above.

Q25. Scope of Work, Expertise in Remedial Technologies, item I. Excavation, Dewatering and Off-Site Disposal, applied treatment train. What is meant by applied treatment train? Please provide an example.

A25. A treatment train is a combination/sequence of treatment technologies, designed to address environmental contamination to maximize results. One example is to excavate contaminated soils and mix clean backfill with reagents to enhance remediation of residual contamination.

Q26. What does Special Factors include and how will points be awarded?

A26. As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications.

Q27. What are the Selection Criteria for Part II proposal for specific technologies?

A27. Pass or fail depending on qualifications and demonstrated experience (in design and construction oversight) related to the selected technology.

Q28. Can the project references provided with the Professional Questionnaire also be used for the Specialized Technology Questionnaires?

A28. Yes.

Q29. Both the Professional Questionnaire and the Specialized Technology Questionnaire call for an organizational chart. Can we submit one overall organizational chart?

A29. Yes.

Q30. Where information requested to be provided in the Technical Proposal overlaps with information requested in the questionnaires (i.e., section II-5 of the Technical Proposal calls for references with contact information and so does Article 2, section 2.2. of the Professional Questionnaire), should we provide this information in both places?

A30. Yes. See A13 above.

Q31. Will we be limited to subcontracting only to those subcontractors included in this RFP response?

A31. See A9 above.

Q32. Section III-2 A refers to a three-year contract duration, but the example table II-2-A in Section IV shows billing rates for five years. Do five years of billing rates need to be provided?

A32. Yes. The contract may be extended for two additional years, at the sole option and discretion of the State, after the expiration of the original three-year contract period.

End of Questions.

APPROVED BY:

PROJECT DIRECTOR DATE

DTMB-0452 (Rev 04/19)

PROFESSIONAL'S INSPECTION RECORD
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION

This form is required to verify visits by the professional service contractor on the job site. Complete this form and attach it to the appropriate payment voucher for services rendered. (Authority: 1984 PA 431)

PROFESSIONAL SERVICE CONTRACTOR			DATE
SIGMA CODING	AGENCY NUMBER	FILE NUMBER	CONTRACT NUMBER
PROJECT NAME			
DEPARTMENT/AGENCY			

DATE	PROFESSIONAL	PURPOSE OF VISIT	TRAVEL TIME	SITE TIME

FIELD REPRESENTATIVE OR CONTRACT ADMINISTRATOR	DATE
PROFESSIONAL SERVICE CONTRACTOR	DATE

APPENDIX 2

PROFESSIONAL'S PROPOSAL

2023 Expanded Environmental Remediation Services ISID

Michigan Department of Technology, Management and Budget

May 4, 2023

fishbeck

Engineers | Architects | Scientists | Constructors

R 08/20

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Certification of a Michigan Based Business

(Information Required Prior to Contract Award for Application
of State Preference/Reciprocity Provisions)

To qualify as a Michigan business:

Vendor must have, during the 12 months immediately preceding this bid deadline:
or
If the business is newly established, for the period the business has been in existence, it has:

(Check all that apply):

☐ Filed a Michigan single business tax return showing a portion, or all the income tax base allocated or apportioned to the State of Michigan pursuant to the Michigan Single Business Tax Act, 1975 PA 228, MCL • ˜208.1 – 208.145: or

☐ Filed a Michigan income tax return showing income generated in or attributed to the State of Michigan; or

☒ Withheld Michigan income tax from compensation paid to the bidder's owners and remitted the tax to the Department of Treasury; or

I certify that **I have personal knowledge** of such filing or withholding, that it was more than a nominal filing for the purpose of gaining the status of a Michigan business, and that it indicates a significant business presence in the state, considering the size of the business and the nature of its activities.

I authorize the Michigan Department of Treasury to verify that the business has or has not met the criteria for a Michigan business indicated above and to disclose the verifying information to the procuring agency.

Bidder shall also indicate one of the following:

☒ Bidder qualifies as a Michigan business (provide zip code: 49546)

☐ Bidder does not qualify as a Michigan business (provide name of State: _____).

☐ Principal place of business is outside the State of Michigan, however service/commodity provided by a location within the State of Michigan (provide zip code: _____)

R 08/20

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Bidder: Fishbeck

Aaron R. Steele, CPA
Authorized Agent Name (print or type)

Authorized Agent Signature & Date

Fraudulent Certification as a Michigan business is prohibited by MCL 18.1268 § 268. A BUSINESS THAT PURPOSELY OR WILLFULLY SUBMITS A FALSE CERTIFICATION THAT IT IS A MICHIGAN BUSINESS OR FALSELY INDICATES THE STATE IN WHICH IT HAS ITS PRINCIPAL PLACE OF BUSINESS IS GUILTY OF A FELONY, PUNISHABLE BY A FINE OF NOT LESS THAN $25,000 and subject to debarment under MCL 18.264.

R 08/20

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

Responsibility Certification

The bidder certifies to the best of its knowledge and belief that, within the past three (3) years, the bidder, an officer of the bidder, or an owner of a 25% or greater interest in the bidder:

(a) Has not been convicted of a criminal offense incident to the application for or performance of a contract or subcontract with the State of Michigan or any of its agencies, authorities, boards, commissions, or departments.

(b) Has not had a felony conviction in any state (including the State of Michigan).

(c) Has not been convicted of a criminal offense which negatively reflects on the bidder's business integrity, including but not limited to, embezzlement, theft, forgery, bribery, falsification, or destruction of records, receiving stolen property, negligent misrepresentation, price-fixing, bid rigging, or a violation of state or federal anti-trust statutes.

(d) Has not had a loss or suspension of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

(e) Has not been terminated for cause by the Owner.

(f) Has not failed to pay any federal, state, or local taxes.

(g) Has not failed to comply with all requirements for foreign corporations.

(h) Has not been debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency.

(i) Has not been convicted of a criminal offense or other violation of other state or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of DTMB indicates that the bidder is unable to perform responsibly or which reflects a lack of integrity that could negatively impact or reflect upon the State of Michigan, including but not limited to, any of the following offenses under or violations of:

   i. The Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.101 to 324.90106.
   ii. A persistent and knowing violation of the Michigan Consumer Protection Act, 1976 PA 331, MCL 445.901 to 445.922.

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

iii. 1965 PA 166, MCL 408.551 to 408.558 (law relating to prevailing wages on state projects) and a finding that the bidder failed to pay the wages and/or fringe benefits due within the period required.

iv. Repeated or flagrant violations of 1978 PA 390 MCL 408.471 to 408.490 (law relating to payment of wages and fringe benefits).

v. A willful or persistent violation of the Michigan Occupational Health and Safety Act, 1974, PA 154, MCL 408.10001 to 408.1094, including: a criminal conviction, repeated willful violations that are final orders, repeated violations that are final orders, and failure to abate notices that are final orders.

vi. A violation of federal or state civil rights, equal rights, or non-discrimination laws, rules, or regulations.

vii. Been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U. s. C. 158 (1980 PA 278, as amended, MCL 423.321 et seq).

(j) Is NOT an Iran linked business as defined in MCL 129.312.

I understand that a false statement, misrepresentation, or concealment of material facts on this certification may be grounds for rejection of this proposal or termination of the award and may be grounds for debarment.

Bidder: Fishbeck

Aaron R. Steele, CPA
Authorized Agent Name (print or type)

Authorized Agent Signature & Date

☐ I am unable to certify to the above statements. My explanation is attached.

R 08/20

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
State Facilities Administration
Design & Construction Division

ACKNOWLEDGMENT OF ADDENDUMS

PSC acknowledges receipt of Addenda: No. __1__ dated: _4/13/2023_,

No. ___ dated: _____ No. ___ dated: _____

TABLE OF CONTENTS

Part I – Technical

General Information and Project Team

Fishbeck is a professional environmental, architectural/engineering, civil engineering, and construction services consulting firm that serves governmental, educational, healthcare, commercial, industrial, and private clients. Our range of services and integrated project approach provides our clients with specifically suited, innovative designs. We are committed to delivering exceptional service, outstanding technical quality, and establishing long-term client relationships.

Our projects range from small feasibility, planning, and regulatory studies to very large design and construction projects. The environmental division is a mix of environmental engineers, chemists, biologists, chemical engineers, air quality experts, compliance/regulatory specialists, geologists, hydrogeologists, certified safety professionals, and wetland experts. Our civil engineering division consists of experienced civil engineers, surveyors, stormwater/drainage experts, and landscape architects. Our architectural/engineering division has complete building design capabilities with architects and structural, mechanical, and electrical engineers. Our construction division offers construction management and design/build services.

Company Type
Employee-owned Corporation

Established
1956

Total Personnel
575+

SIGMA Vendor Number
CV0021627

Website
www.fishbeck.com

Fishbeck is a corporation licensed to operate and practice in the State of Michigan. We are a legal entity permitted by law to sign and seal final design construction contract documents, and licensed under Michigan's professional licensing and regulation provisions of the Occupational Code (State Licensing Law), Act 299 of the Public Acts of 1980, Article 20, as amended, to practice architecture, engineering, environmental engineering, and land surveying services in the State of Michigan. Fishbeck meets the requirements of a Qualified Underground Storage Tank (UST) Consultant (Section 324.21325) under Part 213 of the Natural Resources and Environmental Protection Act.

Fishbeck or any of its related business entities has not defaulted on a contract or had a contract terminated for cause within the last five years.

Locations

MICHIGAN

Grand Rapids (Headquarters) | 1515 Arboretum Drive, SE, Grand Rapids, MI 49546 | 616.575.3824
Ann Arbor | 2001 Commonwealth Boulevard, Suite 200, Ann Arbor, MI 48105 | 734.864.7700
Canton | 44978 Ford Road, Suite A, Canton, MI 48187 | 734.454.7566
Detroit | 1001 Woodward Avenue, Suite 860, Detroit, MI 48226 | 313.293.3550
Kalamazoo West | 4775 Campus Drive, Kalamazoo, MI 49008 | 269.375.3824
Kalamazoo East | 2960 Interstate Pkwy, Kalamazoo, MI 49048 | 269.342.1100
Lansing | 5913 Executive Drive, Suite 100. Lansing, MI 48911 | 517.882.0383
Macomb | 45200 Card Road, Suite 128, Macomb Township, MI 48044 | 586.412.1406
Novi | 39500 MacKenzie Drive, Suite 100, Novi, MI 48377 | 248.324.2090
Traverse City | 821 South Elmwood Avenue, Unit D, Traverse City, MI 49684 | 231.714.9060

OHIO

Cincinnati | 10856 Reed Hartman Hwy, Suite 175, Cincinnati, OH 45242 | 513.469.2370
Columbus | One East Campus View Boulevard, Columbus, OH 43235 | 614.363.1001
Dayton | 7887 Washington Village Drive, Suite 135, Dayton, OH 45459 | 937.291.9092
Toledo | 28366 Kensington Lane, Suite 3, Perrysburg, OH 43551 | 419.841.4704

INDIANA

Indianapolis | 8520 Allison Pointe Boulevard, Suite 100, Indianapolis, IN 46250 | 317.577.9050

Project Team

Fishbeck is submitting this proposal as the lead professional to assist with all potential tasks, as specified in the request for proposal (RFP). Our expertise includes, but is not limited to, regulatory knowledge, remedial investigation (RI), feasibility studies (FS), risk-based-corrective-action (RBCA), remedial design and implementation, bid specifications, construction oversight, community relations needs assessments, and environmental media monitoring. Fishbeck has subcontractor agreements in place to assist with the completion of environmental drilling, laboratory services, waste disposal, and geophysical studies.

Understanding of Projects and Tasks

Fishbeck has extensive experience with completing remedial investigations (RIs), feasibility studies (FSs), remedial design services, and other related tasks as described in the RFP. We have a positive history of working successfully with numerous government and institutional clients including, but not limited to, the MDTMB; Michigan Department of Transportation (MDOT); Michigan Environment, Great Lakes, and Energy (EGLE); Michigan Department of Natural Resources (MDNR); and many state institutions of higher education. Our goal with each project is to provide a work product and recommendations that are in the best interest of the State and provide the best value for the available budget.

As documented in the Professional Questionnaire, our staff is well versed in both State of Michigan and federal environmental regulations and programs and has abundant experience working under Parts 111, 211, 201, and 213 of NREPA, 1994, PA 451, as amended; as well as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA).

We understand the MDTMB is seeking to select a professional firm who can complete the following activities:

- RIs
- FSs
- RBCAs
- Design
- Bid specifications
- Remedial actions
- Construction oversight or management services
- Remediation system operation and maintenance (O&M)
- Groundwater monitoring
- Underground storage tank (UST) removal/closure
- Community relations
- Natural resource damages assessments
- Geophysical studies
- Hydrogeological investigations
- Sampling and analysis of hazardous materials and containers
- Other environmental media sampling – soil, sediment, flora, fauna, water, and air samples
- Evaluation of sample data
- Evaluation and development of disposal and remedial alternatives
- Preparation of environmental impact statements
- Assessing potential uncontrolled hazardous materials sites
- Construction oversight
- Database development and management
- Groundwater sampling and laboratory quality assurance/quality control (QA/QC)
- Provide enforcement support, such as documentation of facts and information about a site and expert testimony during enforcement procedures.
- Provide other program development and management assistance for the state departments/agencies: review of plans, drawings, specifications, proposals, technical reports and other work products associated with a hazardous substance site where a release has occurred or is likely to occur; the assessment of environmental and public health risks; record searches, historical reviews; research on technical issues; and personnel training.

As detailed in the Professional Questionnaire and resumes of key personnel, our project team has completed all aforementioned activities through the tenure of the firm.

We also understand that this current proposal differs from past MDTMB Indefinite-Service, Indefinite-Delivery (ISID) environmental contracts, as it includes a separate section (Part II) that is specific to remediation experience. The goal of the restructuring of the ISID RFP is to allow the State of Michigan to determine which firms have adequate resources and experience to successfully complete various remediation projects using the following broad technology groups:

- Excavation, Dewatering, and Off-Site Disposal
- Demolition
- Migration Control, Fluid Removal, and Containment
- Landfills
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical/Chemical Treatment
- Ex-Situ Physical/Biological Treatment
- In-Situ and Ex-Situ Thermal Treatment (*Fishbeck is not applying for this technology*)
- Per- and Polyfluoroalkyl Substances (PFAS) Treatment
- Alternative Technologies/Post-Remediation Strategies

Fishbeck is well-qualified to be submitting a proposal for consideration in the above remediation technologies, with the exception of the thermal treatment technology. Furthermore, our staff routinely works with government and institutional clients and assists them through all phases of design and construction services. We have abundant experience completing all levels of remediation system design from schematics and preliminary designs to final designs. As part of this process, we coordinate

our efforts with the state/client agency in accordance with the project contract. We execute project tasks paying attention to scheduling and project budget constraints. We routinely analyze and document information on behalf of the state/client agency and make professional recommendations.

Upon completing a final design, which meets the project goals and the approval of the state/client agency, Fishbeck routinely performs both office and field construction administration services. We have assisted the state/client agency through the preparation of bidding documents, review and recommendations, completed oversight, claims analysis, constructability review, and errors and omissions analysis. We understand that in such a capacity we are an extension of the state/client agency and responsible for keeping projects on schedule and within budget.

We have read and agree to comply with all aspects of the RFP. We will abide by the cost and compensation section of the RFP, provide the required deliverables in accordance with a pre-approved project schedule, submit invoices as per the terms of the contract, and follow the terms of the equipment and supply purchase and rental procedures.

We are confident that our professionalism and experience will provide unsurpassed services to the various state agencies with whom we may work. Moreover, with ten office locations in Michigan, we are well positioned to assist with project work throughout the state.

Personnel

Fishbeck realizes the importance of evaluating and assigning appropriate members of our staff to each project. The team of professionals we assemble is uniquely qualified to provide the full range of professional services necessary and is available to commit the time needed to see the project through. The team assigned to your project will be supplemented by additional members of our technical and clerical support staff of over 575 to ensure schedules are met efficiently and effectively.

- The program manager is responsible for the overall implementation of the ISID master contract and ISID contract assignments. The program manager ensuring that all work in performed in accordance with the ISID contract requirements and will communicate with MDTMB and EGLE, as needed. The program manager will also ensure that Fishbeck and ISID contract health and safety and quality control/quality assurance (QA/QC) processes are followed. The program manager will work with all program managers and EGLE to verify that adequate and appropriate resources and expertise are available for each ISID contract assignment, so that each project can be successfully performed efficiently and with high quality.
- Project managers will be responsible for project scoping and work plan development with EGLE, to define project objectives and scope for each contract assignment. The project manager will be responsible for day-to-day project activities, budget tracking, and project progress. The project manager will also be responsible for project QA/QC and health and safety, and will work with program QA/QC and health and safety personnel, respectively. The project manager will the primary point of contact for the client, and will be responsible for identification and coordinate of project personnel and subcontractors.
- Professional staff will be selected for each contract assignments dependent on project scope, complexity, and objectives. Considerations for project team selection includes, but will not be limited to, staff expertise, experience, workload, and location. Professional staff will be responsible for the execution of assigned project tasks pursuant to the project work plan.

Resumes for key staff members have been included for your review in the appendix and an organizational chart is included on the following page. The organization chart also reflect the general communications lines, which will be more specifically defined for each contract assignment. Please reference the matrix at the end of this section for individual key personnel experience and physical location during the performance of this contract. All key personnel are direct employees of Fishbeck. Personnel positions and classifications are provided on the Position, Classification, and Employee Billing Rate Information table in Part II – Cost.

Organizational Chart

MDTMB/EGLE

Program Manager
Alisa Lindsay, PE*

Corporate Health & Safety Manager
Cody Green

Project Managers

Mike Apgar*
David Bohan
Chris Carew*
Rick Dunkin, CPG, LPG*
Paul French*
Bruce Gillett, CPG*
Joel Henry*
Peter Lepczyk, CPG*
Derrick Lingle, CPG*
Mike Ranck, PG*
Jess Watterson*
Chad Weber, PE*
Fernanda Wilson, PhD*
Roman Wilson

Principal-in-Charge
Kerri Miller, PE, LEED AP*

QA/QC
Peter Lepczyk, CPG*
Penni Mahler
David Warwick*
Chad Weber, PE*

Professional Staff

Jacob Abair
Deborah Alderink, CIH, RN
Al Aspacher, PE
Brenda Bailey
Tony Bartol, PS
Nick Battjes
Michelle Bell
Aaron Bigler*
Solomon Boisvert
Tom Budge, CHMM
Todd Campbell, CPG*
David Conklin, PE*
Therese Cotter
Zachary Curry*
Ali Dahlbacka*
Courtney Dunaj
David Filipiak, CHMM*
Becky Flasck, CHMM
Alex Frye
Mark Gatrell
Dawn Grates
Bryana Guevara
Stephanie Hanes
Bailey Hannah*
Audrey Havens
Jeffrey Hawkins
Leanne Jeannot
Alan Jennings
Kyle Knaub
Ryan Krozek
Justin Levande
Hailey Lyczynski
Liz Marsh, PE, CHMM
Logan Maser
Logan Mulholland
Brian McKissen, PE, CFM
Marley McVey
Kyle Murray, PhD
Ryan Musch, PE
Adam Near, CPG
Alyssa Olson
Kirk Perschbacher
Erik Peterson
Brad Peuler, CPG*
Kelli Piper, CHMM
Cheryl Pitchford
Kayla Rooney*
Alex Sackett
Mahta Naziri Saeed
Madison Schrader
Josh Schroedter
Andrew Schwallier
Claire Schwartz, PE
Therese Searles*
Shelbey Senkewitz
Regina Shettler
Lynn Spurr
David Stegink
Nicole Stewart
Alex Struble
Elise Hansen Tripp, PWS
Judy Van Putten
Ariana Wade
Ryohei Wakabayashi
Robert Webster
Susan Wenzlick

FISHBECK TECHNICAL SUPPORT

Architecture/Engineering
Architecture
Electrical
Facility Condition Assessment
Mechanical
Parking Design/ Restoration
Structural
Systems Commissioning

Infrastructure Engineering
Construction Engineering/ Inspection
Geospatial Services
Site Development
Stormwater Management
Transportation
Wastewater Collection
Wastewater Treatment
Water Supply/Treatment

Construction
Construction Management
Cost Estimating
Design/Build

SUBCONTRACTOR SUPPORT

Laboratory Services
Drilling Services
Statistical Services
Risk Assessment
Toxicology
Geophysical
Construction
Survey
Utility Locate

STATE OF MICHIGAN LABORATORY

Key Personnel

Key Personnel Expertise Matrix

KEY PERSONNEL						TECHNOLOGY										
Name	Title	Location	Personnel Classification	Years of Experience in Classification	Direct Fishbeck Employee	I. Excavation, Dewatering, and Offsite Disposal	II. Demolition	III. Migration Control, Fluid Removal, and Containment	IV. Landfills	V. Indoor Air/ Vapor Intrusion	VI. In-Situ Physical/ Chemical Treatment	VII. In-Situ Physical/ Biological Treatment	VIII. Ex-Situ Physical/ Chemical Treatment	IX. Ex-Situ Physical/ Biological Treatment	XI. PFAS	XII. Alternative Technologies/Post Remediation Strategies
Alisa Lindsay, PE	Senior Environmental Engineer	Kalamazoo, MI	P4	11	Yes	•	•	•		•	•		•	•	•	•
Kerri Miller, PE	Senior Vice President/Principal	Grand Rapids, MI	P4	11	Yes	•										•
Peter Lepczyk, CPG	Vice President/Senior Hydrogeologist	Traverse City, MI	P4	11	Yes	•		•		•	•	•	•		•	•
David Warwick	Vice President/Senior Hydrogeologist	Kalamazoo, MI	P4	25	Yes	•	•	•	•	•			•		•	•
Chad Weber, PE	Senior Environmental Engineer	Traverse City, MI	P4	17	Yes	•	•	•	•	•	•	•	•	•		•
Mike Apgar	Senior Environmental Engineer	Grand Rapids, MI	P4	16	Yes	•	•	•	•	•	•	•	•	•	•	•
Chris Carew	Senior Geologist	Kalamazoo, MI	P3	9	Yes	•	•	•	•	•	•	•	•		•	•
Rick Dunkin, CPG, LPG	Senior Geologist	Novi, MI	P4	29	Yes	•	•	•	•	•	•	•	•			•
Paul French	Senior Hydrogeologist	Kalamazoo, MI	P4	22	Yes	•	•	•		•	•	•	•			•
Bruce Gillett, CPG	Senior Hydrogeologist	Grand Rapids, MI	P4	21	Yes	•		•	•	•	•	•	•		•	•
Derrick Lingle, CPG	Senior Hydrogeologist	Kalamazoo, MI	P3	2	Yes	•	•	•	•	•	•					•
Michael Ranck, PG	Senior Hydrogeologist	Raleigh, NC (remote)	P4	8	Yes	•		•		•	•	•	•		•	
Jessie Watterson	Senior Environmental Scientist	Novi, MI	P4	9	Yes	•	•	•	•	•	•	•	•	•		•
Fernanda Wilson, PhD	Environmental Engineer	Grand Rapids, MI	P3	4	Yes				•	•	•	•	•	•	•	
Aaron Bigler	Environmental Scientist	Kalamazoo, MI	P3	2	Yes	•	•			•						
Todd Campbell, CPG	Senior Geologist	Kalamazoo, MI	P4	15	Yes	•	•	•		•	•	•	•			•
David Conklin, PE	Senior Water and Wastewater Engineer	Grand Rapids, MI	P4	29	Yes	•		•	•		•		•	•		
Zachary Curry	Geologist	Kalamazoo, MI	P2	2	Yes	•				•					•	•
Ali Dahlbacka	Environmental Engineer	Grand Rapids, MI	P2	4	Yes	•		•		•	•	•	•			
David Filipiak, CHMM	Environmental Engineer, Chemist	Grand Rapids, MI	P4	25	Yes	•					•	•	•	•	•	
Bailey Hannah	Hydrogeologist	Grand Rapids, MI	P2	1	Yes						•				•	•
Joel Henry	Senior Hydrogeologist	Lansing, MI	P3	15	Yes	•		•	•	•	•					
Brad Peuler, CPG	Senior Geologist	Kalamazoo, MI	P4	8	Yes	•		•	•		•	•				
Kayla Rooney	Geologist	Kalamazoo, MI	P2	1	Yes	•		•		•	•				•	•
Therese Searles	Senior Geologist	Kalamazoo, MI	P3	4	Yes	•	•									

Note: *See key personnel resumes in the appendix for details on experience and roles and responsibilities.*

Fishbeck is not pursuing X. In-Situ and Ex-Situ Thermal Treatment as part of this proposal.

References

Fishbeck is proud of our client relationships and approximately 85 percent of our annual revenue is derived from repeat clients. We have developed ongoing associations with the representative list of past and current clients and encourage you to contact them for their impressions of our services.

ATI (a TDY Industries, LLC company)
Mark Thomasen, REM, CHMM
302.368.7350 | mark.thomasen@atimaterials.com

Enviro Analytics Group (EAG) (a Commercial Development Company company)
Elizabeth Schlaeger, PE
314.307.1734 | eschlaeger@enviroanalyticsgroup.com

MAHLE Industries, Inc.
Michael Zack
248.305.8200 | michael.zack@mahle.com

Michigan Department of Environment, Great Lakes, and Energy – Remediation and Redevelopment Division
Ron Smedley
517.242.9048 | smedleyr@michigan.gov

Michigan Department of Environment, Great Lakes, and Energy – Remediation and Redevelopment Division
Steven Beukema, Ph.D
269.547.0125 | beukemas@michigan.gov

Michigan Department of Environment, Great Lakes, and Energy – Materials Management Division
Daniel P. Dailey, MA, PE
517.242.7261 | daileyd@michigan.gov

Questionnaire for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Service Indefinite-Delivery
Expanded Environmental Remediation Services

PRIMARY QUESTIONNAIRE – PART I

INSTRUCTIONS: This questionnaire aims to collect information regarding the Professonals general capability to provide the type of work requested in this RFP. Specialized technology specific information should be provided in the 'specialized technologies questionnaire' a sample of which is provided in Attachment IV. Professionals shall complete the following required information in the fillable form provided. A separate sheet may be used if additional space is needed. The Article number(s) relating to the additional information must be included on the separate sheet, if used. Professionals are to ensure all questions are answered completely and concisely to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck
Business Organization Address: 1515 Arboretum Drive SE, Grand Rapids, MI 49546
Telephone and Fax: T: 616.575.3824 | F: n/a
Website and E-mail: www.fishbeck.com | info@fishbeck.com
ISID Contract Contact Person Name & E-Mail: Alisa Lindsay, PE | alindsay@fishbeck.com
Professional(s) SIGMA Vendor ID number(s): CV0021627

If Applicable, state the branch office(s), partnering organization or other subordinate element(s) that will perform, or assist in performing, the work:
Fishbeck branch offices in Michigan:

- 39500 MacKenzie Drive, Suite 100, Novi, MI 48377
- 5913 Executive Drive, Suite 100, Lansing, MI 48911
- 4775 Campus Drive, Kalamazoo, MI 49008
- 2960 Interstate Parkway, Kalamazoo, MI 49048
- 821 South Elmwood Avenue, Unit D, Traverse City, MI 49684
- 45200 Card Road, Suite 128, Macomb Township, MI 48044
- 1001 Woodward Avenue, Suite 860, Detroit, MI 48226
- 44978 Ford Road, Suite A, Canton, MI 48187
- 2001 Commonwealth Boulevard, Suite 200, Ann Arbor, MI 48105

Fishbeck acquired Envirologic Technologies, Inc (Envirologic) on January 1, 2023, resulting in the assimilation of 25 new highly experienced environmental professionals. This acquisition enhances Fishbeck's already robust staff of environmental professionals and ability to better support the needs of EGLE's ISID contract assignments. With this acquisition, Fishbeck has also enhanced its geographic reach with staffing in most major Michigan metropolitan areas: Grand Rapids, Kalamazoo, Ann Arbor, Novi, Lansing, Midland, Alpena, Traverse City, and Grand Haven/Muskegon. Fishbeck also has extensive experience serving clients in all regions of the Upper Peninsula.

The following person(s) are authorized to receive and sign a resulting contract and / or subsequent assignment(s).

Kerri A. Miller, PE, LEED AP, Senior Vice President/Principal | 1515 Arboretum Dr. SE, Grand Rapids, MI 49534 | kamiller@fishbeck.com | 616.464.3933

Peter A. Lepczyk, CPG, Vice President/Senior Hydrogeologist, 821 South Elmwood Ave., Unit D, Traverse City, MI 49684 | palepczyk@fishbeck.com | 616.464.6238

Aaron R. Steele, Vice President/Treasurer, 1515 Arboretum Dr. SE, Grand Rapids, MI 49534 | arsteele@fishbeck.com | 616.464.3705

David B. Warwick, Vice President/Senior Hydrogeologist, 2960 Interstate Pkwy., Kalamazoo, MI 49048 | dwarwick@fishbeck.com | 269.544.6978

1.2 Check the appropriate operation status:
☐ Individual ☐ Association ☐ Partnership ☒ Corporation, or ☐ Combination – Explain: _____

1.3 If operating as a corporation, include the state of incorporation (Michigan) and the date of incorporation (January 3, 1967).

1.4 Include a brief description of Professional's business history:
Fishbeck is a full-service architectural/engineering, civil engineering, environmental, and construction services consulting firm. Since 1956, we have provided our clients with innovative designs, technical quality, and exceptional service. We help people realize their visions while benefiting society. Fishbeck has provided environmental consulting services to various State agencies (e.g., EGLE, MDOT, etc.) and a wide range of industries including land development, transportation, agriculture, paper, plastics, plating, metal fabricating, foundries, pharmaceuticals, utilities, former power plants, manufacturing, and waste disposal facilities. We are able to effectively serve our clients in all regions of the State of Michigan with our broad office geographic footprint.

1.5 Professional(s) federal I.D. number: 38-1841857

ARTICLE 2: PRIOR EXPERIENCE

2.1 Identify the project types and professional services for which your firm is exceptionally qualified and experienced.

- ☒ Excavation, Dewatering and Off-Site Disposal
- ☒ Demolition
- ☒ Migration Control, Fluid Removal, and Containment
- ☒ Landfills
- ☒ Indoor Air/Vapor Intrusion
- ☒ In-Situ Physical/Chemical Treatment
- ☒ In-Site Physical/Biological Treatment
- ☒ Ex-Situ Physical Chemical Treatment
- ☒ Ex-Situ Physical/Biological Treatment
- ☐ In-Situ and Ex-Situ Thermal Treatment
- ☒ Per-and Polyfluoroalkyl Substances (PFAS) Treatment
- ☒ Alternative Technologies/Post Remediation Strategies

2.2 Provide client references and brief descriptions for at least three (3) projects in the last five years closely related to the work requested in this RFP. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided RI/FS services

Project 1 Reference Information:

Project Name: Military Equipment Manufacturing Facility Environmental Services
Key Personnels: Peter Lepczyk CPG, Chad Weber PE, Brad Peuler CPG, Fernanda Wilson PhD, Ali Dahlbacka, Chris Carew, Todd Campbell CPG, Mike Apgar, and Bailey Hannah
Project Address: 76 South Getty Street
Project City/State/Zip: Muskegon, Michigan 49442
Owner/Client Contact Name and Telephone #: Mark Thomasen, REM, CHMM – 302.368.7350

Project 1 Description:

Since 2019, Fishbeck has performed investigative and remedial activities at a legacy industrial site in Michigan used for the manufacture of military equipment. Fishbeck was retained by the performing defendants established under a Consent Decree (CD) to implement a complex statement of work to address chlorinated volatile organic compounds (CVOCs), light nonaqueous phase liquids (LNAPLs), metals, polychlorinated biphenyls (PCBs), cyanide, and per- and poly-fluoroalkyl substances (PFAS). Activities are being performed consistent with Part 111 of Michigan's Natural Resources and Environmental Protection Act.

To date, the following tasks have been performed Fishbeck in accordance with the CD:

- Preparation of detailed work plans and a quality assurance project plan for EGLE review and approval.
- Characterization of the hydrogeology, including hydrostratigraphy, groundwater velocities, position of groundwater divide, temporal variation, and groundwater/surface water interface (GSI).
- Determination of the spatial distribution of dissolved-phase impacts within the aquifer and the location of areas of elevated CVOC mass.
- Design, construction, and operation of a soil vapor extraction (SVE) system to reduce CVOCs in the unsaturated zone.
- Design, construction, and operation of an enhanced reductive dechlorination (ERD) system to remediate CVOCs in the groundwater.
- Excavation and offsite disposal of metals-impacted soil.
- Design and construction of exposure barriers to prevent contact with metal, cyanide, and PCB-impacted soil.
- Placement of restrictions and environmental license agreements to ensure future uses are protective of human health and the environment.

Fishbeck utilized both conventional and high-resolution site characterization (HRSC) technologies to perform much of the hydrogeological and remedial investigative (RI) work. The HRSC included advancement of 110 membrane interface probe/hydraulic profiling tool (MiHPT) borings to characterize the spatial distribution of VOCs and hydrostratigraphy throughout the multiple areas of concern (AOCs). These data were used to develop conceptual site models (CSMs) for the AOCs. The approved CSM for the GSI pathway demonstrated that the historical monitoring well network was not representative of VOCs venting to the adjacent creek/wetland system. Fishbeck determined that CVOCs present within the lower portion of the aquifer were transported parallel beneath the creek/wetland system, rather than venting vertically to the creek/wetland nearest to the monitoring point. A network of alternative monitoring points (including pore water samplers) is scheduled for installation in 2023.

Following HRSC, Fishbeck designed a focused ERD system in one of the AOCs established in the CD with the objective of rapidly reducing CVOC concentrations in groundwater. The ERD system was comprised of 40 permanent injection/extraction wells and select existing wells from a previous ERD effort positioned in three separate treatment areas. The first emulsified vegetable oil (EVO) injection occurred in 2020. In total, approximately 13,000 gallons of EOS_{Pro} were distributed and over 4,000,000 gallons of groundwater were recirculated to distribute the EVO and a bioaugmentation culture. Performance monitoring data collected to date indicate that ERD is effectively remediating CVOCs throughout the three treatment zones. A second EVO injection event will be performed in 2023.

Fishbeck designed and oversaw the construction of an SVE system consisting of 11 SVE wells, underground conveyance piping, a flow distribution manifold, an SVE blower, and a vapor treatment system. Extracted vapors were treated using three granulated activated carbon adsorbers plumbed in series. The system was constructed in

November 2019, and full-time operation started on December 2, 2019. Fishbeck maintained and operated the SVE system for two years (until November 30, 2021), as specified in the CD. During that time, the system removed an estimated 734 pounds of CVOCs from the vadose zone.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: MAHLE Industries, Inc. – Harvey Street Facility
Key Personnels: Bruce Gillett CPG, Mike Apgar, and Bailey Hannah
Project Address: 2051 S. Harvey Street
Project City/State/Zip: Muskegon, Michigan 49444
Owner/Client Contact Name and Telephone #: Michael Zack, MAHLE Industries, Inc. – 248.305.8200

Project 2 Description:
This project included hexavalent chromium and trichloroethene (TCE) remediation in source area soils and groundwater attributable to historical piston ring manufacturing. Fishbeck performed the investigative activities necessary to characterize the nature and extent of impacts, feasibility studies, remediation design, construction, and performance monitoring, including development of all associated work plans and reporting.

TCE remediation was accomplished using an aggressive AS and SVE system; the extracted vapors were treated with a carbon adsorption system prior to discharge. After operation of the AS/SVE system for approximately four years, soil and groundwater verification sampling was performed to demonstrate that closure criteria were met.

The hexavalent chromium remediation was accomplished using *in situ* injection of calcium polysulfide to reduce the chromium to an immobile form. Hexavalent chromium concentrations in groundwater were reduced from over 500,000 µg/L to less than the drinking water criterion of 100 µg/L. Control of offsite migration of impacted groundwater was accomplished by the design, installation, and O&M of two purge wells. Extracted groundwater was discharged to the sanitary system under permit from Muskegon County. The extraction wells are no longer operating as the concentrations have dropped below applicable criteria.

Although the injections also treated the source area soils, an impermeable polyurea liner and new concrete floor were installed in the source area to prevent potential leaching of residual hexavalent chromium in the soil. Institutional controls were implemented to prohibit groundwater use and disturbance of the impermeable liner/concrete over the source area soils. A no further action status is being pursued for hexavalent chromium and EGLE approval is anticipated in 2024. Delineation of the nature and extent of recently discovered PFAS compounds is ongoing.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 3 Reference Information:
Project Name: Pools Prairie Superfund Site Manufacturing Plant Area
Key Personnels: Ali Dahlbacka, Michael Apgar, and Peter Lepczyk CPG
Project Address: 3551 Doniphan Drive
Project City/State/Zip: Neosho, Missouri 64850
Owner/Client Contact Name and Telephone #: Edgard Bertaut – 412.395.3052

Project 3 Description:

Fishbeck was selected by the responsible parties established in a Settlement Agreement to design and implement a removal action strategy for a former rocket engine development and testing site. The contaminants of concern included CVOCs (primarily TCE) and petroleum hydrocarbons [PHCs]) in seven discrete areas of the site. The prescribed action was to excavate the most heavily impacted soil, treat residual CVOCs using SVE, and biologically degrade residual petroleum hydrocarbons with a bioventing system.

Fishbeck's design included details for excavation and onsite treatment of nearly 6,000 cubic yards of soil, installation of 10 horizontal vapor extraction trenches and 16 vertical SVE wells, and installation of a low-volume unsaturated zone bioventing (i.e., air sparging) system. With regulatory approval, Fishbeck began implementing the removal action plan using a combination of in-house staff and select local contractors. Site preparation activities included the abatement and demolition of existing site structures, repair of an existing landfarming facility, dredging of sediments from an existing stormwater collection basin, and construction of a stormwater collection and treatment system. The stormwater treatment system consisted of a dual duplex particulate filtration system and granular activated carbon.

TCE concentrations in excavated soils as high as 3,700,000 micrograms per kilogram (µg/kg) were effectively reduced to the established treatment standard of 1,000 µg/kg; TCE concentrations in most treated soil samples were less than 300 µg/kg. The SVE systems included an innovative use of deep trenching technology to provide a larger surface area for extraction in the clay-rich upper residuum (0 to 30 feet below ground surface) and increase the likelihood of intersecting permeable layers, thereby enhancing airflow through impacted soils. Vertical SVE wells were used in a deeper, more permeable soil zone. In March 2022, the U.S. Environmental Protection Agency (USEPA) provided concurrence that the SVE systems have removed the mass of CVOCs in source area soils at the manufacturing plant area to the extent practicable, and as such, have met or exceeded the requirements for the removal set forth in the settlement agreement.

The bioventing system designed and constructed to address residual PHCs in shallow vadose zone soils included the installation of 16 air injection wells, an air compressor skid, and a flow control manifold. Throughout operation of the bioventing system, oxygen and carbon dioxide concentrations were monitored and used to calculate oxygen utilization and carbon dioxide production rates. In March 2022, the USEPA provided concurrence that the objective of the vadose zone PHC remediation had been achieved.

In 2022, the SVE and bioventing infrastructure at the manufacturing plant area were decommissioned. Fishbeck is currently preparing a final removal action report describing all removal action activities conducted at the manufacturing plant area.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Migration Control, Fluid Removal, and Containment
- Landfills
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

Project 4 Reference Information:

Project Name: Ionia Landfill
Key Personnels: Brad Peuler CPG and Chris Carew
Project Address: Cleveland Street
Project City/State/Zip: Ionia, Michigan 48846
Owner/Client Contact Name and Telephone #: City of Ionia, Precia Garland – 616.527.5776

Project 4 Description:

The Ionia City Landfill is a 27-acre CERCLA (Superfund) site located within the floodplain of the Grand River that

operated from the mid-1930s until the late 1960s. Waste disposed at the site originated from residential, commercial, and industrial sources. Releases from drummed wastes resulted in subsurface contamination by paint thinners and industrial solvents, including TCE, methylene chloride, styrene, toluene, and xylenes. Following the removal of the drums, the site was secured by placing a soil cover over the waste material and constructing a perimeter fence. Following completion of a RI/FS, a consent decree was agreed upon which specified two remedial actions for the groundwater: a pump and treat system for the most impacted portion of the plume (utilizing an air stripper for VOC removal) and monitored natural attenuation (MNA) for the remainder of the plume.

Over time, Fishbeck negotiated with the USEPA and EGLE for an amendment to the record of decision allowing for cessation of the pump and treat system and transition to an MNA approach for the entire plume. Groundwater monitoring is now conducted on a five-year frequency to evaluate the progress of natural attenuation and GSI compliance. Quarterly site inspections are completed to evaluate the condition of the site fencing and landfill cap and slope.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- Landfills
- Ex-Situ Physical Chemical Treatment

Project 5 Reference Information:

Project Name: Former Detrex Facility
Key Personnels: Derrick Lingle CPG, David Warwick, Kayla Rooney, and Paul French
Project Address: 312 Ellsworth Avenue SW
Project City/State/Zip: Grand Rapids, Michigan 49503
Owner/Client Contact Name and Telephone #: Elizabeth Schlaeger, Commercial Development Corporation – 314.307.1734

Project 5 Description:

Envirologic (now Fishbeck) was retained to implement a complex scope related to site investigation, vapor intrusion mitigation, and remediation at the former Detrex facility. The facility conducted solvent sales and collection of solvent wastes from various industries between 1970 and 1996. The former Detrex building is situated in a densely developed portion of downtown Grand Rapids and is currently utilized as a photography studio.

During a RI at the facility in 2016, elevated concentrations of TCE were found in sub-slab soil gas and indoor air, at which point the building was temporarily evacuated and the U.S. Environmental Protection Agency (USEPA) overtook regulatory oversight. Fishbeck designed and oversaw the installation of a vapor mitigation system (VMS), which provides sub-slab vacuum coverage for the facility and two adjacent buildings as well as a sub-membrane depressurization for an earthen crawl space. The VMS was designed to mimic a SVE system (i.e., extended suction points and larger blower) for enhanced source removal. An estimated 6,000 pounds of TCE has been extracted and treated with granular activated carbon. Fishbeck is in the process of designing a second VMS for a nearby building.

During the RI activities, Fishbeck utilized high resolution site characterization (HRSC) methods to identify source areas in a complex glacial depositional sequence with multiple saturated zones and chlorinated solvent-related contaminates migrating in differing directions. Fishbeck oversaw the collection of approximately 1,400 feet of MiHPT data to characterize the lateral/vertical extent of impact and guide future monitoring well installation. To date, approximately 83 monitoring wells are associated with the subject investigation – all installed via hollow-stem auger or rotosonic methods.

Given the extent of impact that has been identified, Fishbeck has collected indoor air and/or sub-slab soil gas samples from 10 buildings (nine offsite). The vapor intrusion pathway has also been further characterized by sampling contaminant vapors in sewer mains (storm and sanitary) across the study area as well as further evaluation in sanitary sewer traps/floor drains in three buildings.

Source remediation efforts included the injection of zero valent iron (ZVI) via fracture emplacement to overcome the high contaminant mass, low formation permeability, and concern for back-diffusion. Fishbeck oversaw the

injection of approximately 66,000 pounds of ZVI via 15 induced fractures within the source area. Groundwater TCE concentrations in the treatment area have decreased by approximately 75% to date, and monitoring is ongoing.

The following remedial technologies were utilized in this project:

- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 6 Reference Information:

Project Name: City of Ludington Wastewater Treatment Plant (WWTP)
Key Personnels: Dave Filipiak CHMM and Chad Weber PE
Project Address: 5160 West Sixth Street
Project City/State/Zip: Ludington, Michigan 49431
Owner/Client Contact Name and Telephone #: Chris Cossette, City of Ludington – 231.843.3190

Project 6 Description:

Fishbeck assisted the City of Ludington with improvements to their WWTP and performance of a groundwater study to evaluate the nature and extent of impacts from historical discharges to a former sludge pond and lagoons.

The City's WWTP consists of aerated lagoons, final clarifiers, and chlorination. Increased flow and industrial loading over recent years necessitated treatment improvements. Fishbeck designed and provided oversight of the construction of WWTP improvements including a new headworks building with septage receiving, mechanical bar screen, and vortex grit removal; converting one of the existing lagoons to an equalization basin, two extended aeration treatment basins, and two biosolids storage basins; replacing final clarifier mechanisms; constructing a baffled/serpentine-walled chlorine contact tank and implementing dechlorination equipment; replacing clarifier feed pumps, return activated sludge pumps, treatment blowers, and the pumps at the main collection system pump station; and upgrading the electrical system and installing stand-by power generators. Construction activities, which were performed during 2020 and 2021, required the removal, stabilization, and offsite (landfill) disposal of PFAS-impacted sludge material. Fishbeck also helped the City obtain a low-interest loan from Michigan's Water Pollution Control Revolving Fund (State Revolving Fund, SRF).

In conjunction with the WWTP improvements, from 2019 through 2021, Fishbeck performed extensive hydrogeological studies to characterize PFAS, metals, and other wastewater-related impacts to groundwater resulting from historical use of a sludge pond at the site. The hydrogeological studies were performed in accordance with EGLE-approved work plans. An incremental sampling approach was also implemented to characterize the soils beneath a former lagoon upgraded as part of the WWTP improvements. The hydrogeological studies identified groundwater impact extending across an approximate 0.4 square mile area. Fishbeck performed a groundwater remediation feasibility study which concluded that, given the absence of receptors within the area of impact, a groundwater use ordinance coupled with long-term monitoring was the preferred response activity.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Ex-Situ Physical/Biological Treatment
- Per-and Polyfluoroalkyl Substances (PFAS) Treatment
- Alternative Technologies/Post Remediation Strategies

Project 7 Reference Information:

Project Name: Ott/Story Superfund Site – Groundwater Treatment System
Key Personnels: Dave Conklin, PE
Project Address: 453 Agard Road
Project City/State/Zip: Muskegon, Michigan 49445
Owner/Client Contact Name and Telephone #: Priyank Patel, EGLE – 517.285.3724

Project 7 Description:

Historical releases at the Ott/Story Superfund site occurred as a result of former organic chemical manufacturing operations and discharges of wastes to onsite lagoons. The primary chemicals of concern are VOCs including benzene, PCE, TCE, toluene, vinyl chloride, and xylene; other organics including PCBs and pesticides; and metals including arsenic. In the late-1990s, a groundwater pump and treat remedy was implemented to intercept contaminated groundwater migrating toward the Little Bear Creek system.

Fishbeck has operated the groundwater treatment facility at the site since September 1999. Fishbeck manages a staff of four at the facility under a prime contract with EGLE. The 1.35-million-gallon-per-day Ott/Story facility is the largest groundwater treatment facility in Michigan. The treatment facility utilizes or has utilized the following unit processes:

- Groundwater collection using ten extraction wells
- Air stripping using aerators
- Powder activated carbon treatment
- Continuously backwashed pressure filtration
- Carbon adsorption
- Thermal oxidation for off gas treatment
- Sludge thickening
- Plate and frame filter for sludge dewatering
- Ferric chloride feed system
- Polymer feed system
- Oxycharger aeration system

Fishbeck is responsible for all aspects of operation, including O&M of the extraction wells and treatment systems; system optimization; purchasing of chemicals, equipment, and supplies using a computerized inventory and maintenance program; management of an in-plant laboratory; preparation of monthly discharge monitoring reports; and coordination with the USACE, USEPA, EGLE, and other state and federal contractors.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- Ex-Situ Physical Chemical Treatment
- Ex-Situ Physical/Biological Treatment

2.3 A sample of field activity logs detailing a 1-week period (from one of the three (3) prior experience sites) and a weekly report provided? ☒Yes ☐No

An example weekly report and field notes generated during implementation of Project 1 referenced above are attached. In accordance with MDTMB contract requirements, for projects involving construction administration services, form DTMB-0452 Professional's Inspection Record will be prepared to document field visits completed under this contract.

ARTICLE 3: ENVIRONMENTAL EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas:

3.1 Remedial Investigations:

Fishbeck is recognized nationally for our ability to solve complex environmental contamination problems. Our staff routinely prepare RI work plans, complete RI activities, interpret RI data, and author RI technical reports under both State of Michigan (NREPA, 1994 PA 451, as amended) and federal CERCLA and RCRA programs. Our environmental team is comprised of seasoned professionals who are well versed in both established and evolving RI methodologies (e.g., high resolution site characterization such as MiHPT and LIF, subsurface geophysics, incremental sampling and analysis, compound specific isotope analysis (CSIA), and molecular biological tools).

Understanding the sources, pathways, and receptors is critical in any environmental project. Accordingly, our typical approach to remedial investigations begins with a thorough review and evaluation of historical data to construct a CSM. The creation of a CSM at the start of a project helps to build an understanding of the processes controlling the fate and transport of chemicals of concern (COCs) in the environment, as well as identify potential data gaps. The identification of

remedial objectives and data gaps in the CSM informs the scope of subsequent RI work plans. Key to a successful RI is adherence to the Quality Assurance Project Plan (QAPP), which provides the framework for assessing how the environmental data will be collected to achieve specific project objectives, and describes the procedures that will be implemented to obtain data of known and adequate quality. Thorough planning is key to completing the RI on schedule and within budget.

Fishbeck has implemented numerous RIs over the tenure of the firm across a variety of environmental media (i.e., soil, sediment, groundwater, surface water, pore water, soil gas, etc.), identifying the nature and extent of a broad spectrum of COCs, including PFAS. Our highly trained geologists and hydrogeologists have overseen various drilling methods, including hollow-stem auger, direct push, mud rotary, cone penetrometer, and rotosonic. Additionally, our staff is well versed in completing other RI-related field tasks, including, but not limited to:

- Groundwater monitoring
- Groundwater/surface water interactions including pore water sampling
- Soil sampling
- Incremental sampling
- Directing geophysical studies
- Hydrogeological studies
- Aquifer testing
- Air sampling
- Sub-slab/soil gas sampling
- Sediment, flora, fauna, and surface water sampling
- Ecological assessments

RI activities are staffed with self-reliant individuals who excel at problem solving and can adapt to changing field conditions. We involve relevant stakeholders throughout the RI process while following clear lines of communication.

RI technical reports clearly document and explain the findings of the investigation activities through narrative, tables, graphs, and figures; document the investigation methods; and provide concise conclusions. Depending on the scope of the project, our reports often include a description of the CSM to present our understanding of the entire geosystem as it relates to the site. Through the integration of geology, hydrogeology, geochemistry, microbiology, and contaminant chemistry, we pride ourselves in developing a comprehensive understanding of the site. This understanding lends itself to the successful completion of risk evaluations, feasibility studies, and remedial design, as applicable. Fishbeck professionals often perform human health and ecological risk assessments, with examples discussed in the project profiles (e.g., TDY Avionics, Graceland Fruit projects).

3.2 Sampling and Laboratory Analysis:

Fishbeck staff are well-versed in sampling a variety of environmental media, including soil, groundwater, soil gas, sediment, surface water, pore water, air, potential hazardous materials, etc. We follow current EGLE Remediation and Redevelopment Division (RRD) operational memoranda, USEPA guidelines, and our own comprehensive standard operating procedures (SOPs), which address each element of the sampling process. Examples include: *Documentation of field activities*, *Pore water collection using a push point sampler or larger-diameter pore water sampler, Sediment sampling using a sediment core sampler, Low-flow groundwater sample collection using a bladder pump, and Sampling Procedure for Per and Polyfluoroalkyl Substances (PFAS)*.

Fishbeck staff maintain an up-to-date understanding of laboratory analytical methods. All environmental laboratory and field data undergo a quality control review/validation process by our environmental data specialist (Penni Mahler) who is not involved in the field collection process. We routinely initiate new monitoring programs and protocols as our industry advances (i.e., vapor intrusion, incremental sampling, etc.), while continuing to maintain operation of existing monitoring programs. Our staff has an abundance of experience preparing SAPs and QAPPs for environmental monitoring, especially as they relate to RCRA and CERCLA/Superfund projects.

Fishbeck staff understand the importance of collecting representative environmental samples, and we pride ourselves through our adherence to EGLE RRD operational memoranda and Fishbeck SOPs. Moreover, we ensure proper sample preservation, labeling, handling, documenting, and submittal. We also ensure field equipment is decontaminated and collect quality assurance/quality control samples to ensure sample integrity.

Lastly, our staff stay knowledgeable on new sampling methodologies and techniques as our industry continues to evolve. Recent examples include, but are not limited to, sub-slab soil gas investigations, incremental sampling and analysis, PFAS sampling, compound specific isotope analysis (CSIA), using molecular biological tools, etc. Fishbeck continually invests in the technical development of our professionals through attendance and participation at national and state-level environmental conferences (e.g., Battelle and REMTEC), membership and active participation in ITRC (e.g., PFAS technical team), and ongoing webinars provided by vendors, ITRC, and EGLE.

3.3 Feasibility Studies:

Fishbeck utilizes our interdisciplinary staff of scientists and engineers to develop remedial solutions to meet the unique challenges posed by each site. During the FS planning stage, we carefully consider the CSM and ensure that the remedial action objectives are well defined. We typically follow USEPA FS guidance developed for the CERCLA program, which generally adhere to the following process:

- Scoping
- Establishment of remedial action objectives
- Developing general response actions
- Identifying and screen potential treatment technologies
- Selecting a representative process for each technology type
- Reevaluating data needs
- Assembling technologies into alternatives
- Screening alternatives
- Completing a detailed analysis of alternatives

Fishbeck has completed numerous feasibility studies during the past several years, with examples including remediation of VOC and PNA contamination in a heterogeneous vadose zone; CVOC groundwater contamination affecting three separate aquifer zones; a TCE dense nonaqueous phase liquid (DNAPL) plume, and a petroleum LNAPL source area.

3.4 Site Closure:

Fishbeck has been responsible for a number of site closures throughout the history of the firm, with examples of completed and pending closures detailed in the accompanying project profiles (e.g., Raymond Road/Davis Oil LNAPL plume, Pools Prairie Superfund site, Former DTE Marysville Power Plant, Lamont Street project, MAHLE Industries Harvey Street facility, PS Food Mart). We have extensive experience with Part 213 site closure requirements. During the past five years, we have been responsible for several clean site closures, which have met Part 213 Tier I risk-based screening levels, as well as restricted site closures, which have adequately addressed potential exposure pathways through the use of restrictive covenants.

3.5 Health and Safety:

Fishbeck's corporate Health and Safety Manager, Cody Green, ensures compliance with the general safety requirements set forth in 29 CFR 1910 and specific safety standards for working at hazardous waste sites (29 CFR 1910,120) as related to the professional scope of work activities that may result from this ISID contract. Fishbeck also follows related Occupational Safety and Health Administration/Michigan Occupational Safety and Health Administration (OSHA/MIOSHA) safety practices, such as the Hazardous Communication Standards (29 CFR 1910.1200).

Fishbeck has a mandatory medical monitoring program that consists of a pre-employment physical, as well as annual and termination physicals. The physicals are completed in accordance with the requirements of Section (f) of 29 CFR 1910.120 and make certain the employee is fit to perform work-related activities, fit to wear a respirator while performing work, provide a baseline for data comparison with future medical screening, and may mark early signs of adverse health effects. Medical screening includes occupational and medical history, physical examination, respirator fit testing, blood and urine tests, and other tests on an as-needed basis (i.e., EKG and/or stress tests).

All Fishbeck employees who are involved in hazardous waste related activities are required to complete a 40-hour HAZWOPER course (meeting the requirements of OSHA Title 29 CFR 1910.120 HAZWOPER). Each year, all HAZWOPER trained employees receive an additional 8-hr annual refresher, meeting the same requirements specified above.

Site-specific health and safety plans (SSHASP) are prepared for all sites where hazardous waste related activities are performed. Information included in the SSHASPs include, but is not limited to, site location and project description,

health and safety organization and responsibilities, general procedures for site activities, chemical hazards, physical hazards, site-specific health and safety procedures, emergency and medical response plan, SSHASP acknowledgement form, safety briefing checklist, National Institute for Occupational Safety and Health (NIOSH) guide sheets, material safety data sheets (MSDSs), map to nearest hospital, and release notification requirements in Michigan. Employees are required to read, understand, abide by, and sign SSHASPs prior to working at a site.

In addition to its corporate Health and Safety Manager, Fishbeck has a Certified Safety Professional on staff and has staff that conducts HAZWOPER 40-Hour training for Western Michigan University's Hydrogeology Field Camp. With it's robust health and safety program and qualified staff, Fishbeck is able to provide training on asbestos, lead, personal protective equipment (PPE) and respiratory usage, HAZWOPER training (40-hour, 8-hour annual, emergency response, RCRA operations, etc.), OSHA hazard communication standard, confined space training, bloodborne and airborne pathogens, and regulatory training (hazardous waste regulatory compliance training, DOT shipping requirements, etc.), amongst other topics.

3.6 UST Removal and Closure:

Fishbeck's team of professionals are qualified for and routinely provide assistance to owners/operators requiring UST removal and closure services. We have a working knowledge of Part 211 UST closure requirements. As a qualified UST consultant, with many certified UST professionals on staff, we have overseen a number of UST removals and tank closures throughout the years. For more than two decades, Fishbeck has held an as-needed contract with the City of Grand Rapids to assist and manage USTs discovered within city rights-of-way during utility construction projects. Fishbeck also holds a current contract with MDOT to provide as-needed UST removal services for the northern lower peninsula and upper peninsula of Michigan.

3.7 Quality Assurance/Quality Control:

It is the mission of Fishbeck's Environmental Division to provide services that meet or exceed our client's expectations for completeness and quality, in a manner that conforms to the client's standards and requirements. We work to provide our clients with technically sound and complete project deliverables that are defensible, cost-effective, and submitted on schedule. Almost everything we do is directly dependent upon the collection and use of environmental information. This environmental information includes not only quantitative environmental data, but the qualitative descriptions of the environment or processes involving it. Our field staff gather environmental information in accordance with our quality management plan (QMP) so that the information collected is of known quality and is adequate for the intended use. QA/QC activities are commensurate with the individual project's size and complexity.

To that effect, we have processes and SOPs in place that address:

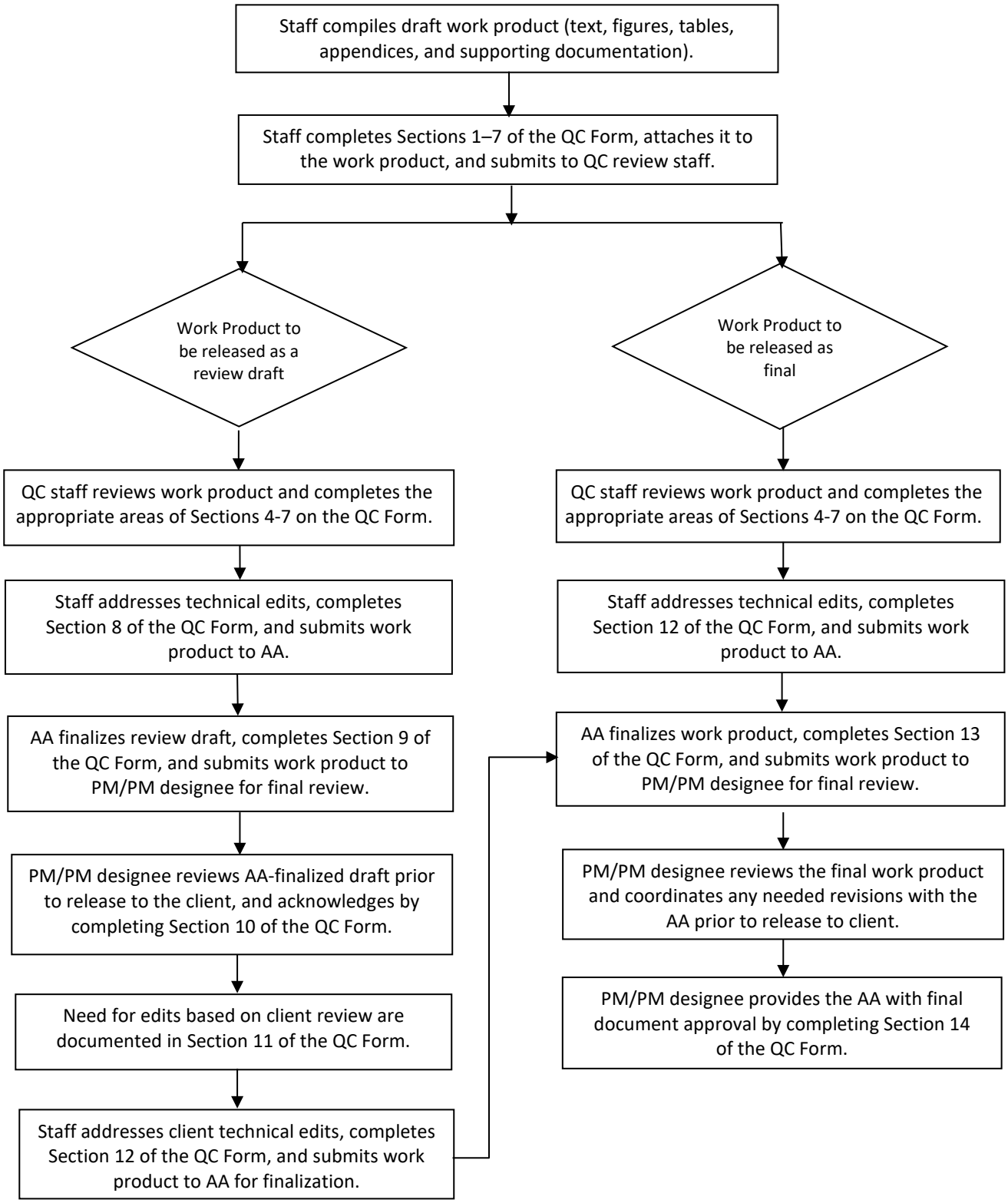
- Environmental information operations
- Project management and project planning
- Data collection and analysis
- Documents and records
- Assessment and response
- Quality improvement

Fishbeck is well-versed in the preparation of quality assurance project plans (QAPPs) for EGLE and USEPA review and approval, with this task often required for state and federal grant-funded projects and other projects with a regulatory oversight component. The QAPP provides a framework for assessing how environmental data will be collected to achieve specific project objectives, and describes the procedures that will be implemented to obtain data of known and adequate quality. For applicable projects, Fishbeck is able to perform the appropriate data validation process required by these QAPPs in-house.

As it relates to technical work product, all deliverables that contain evaluations, interpretations, and/or opinions of data or other information are reviewed in accordance with our *Quality Control Review Process for Technical Work Product* SOP. Data generated by Fishbeck staff in the field must also be reviewed in accordance with this procedure. The project manager (PM) is responsible for initiation and confirmation of the QC process. Our QC Documentation Form (QC Form; included in the Appendix) is prepared by the staff member generating the work product. A summary of this process is provided below in narrative and as a flowchart.

1. All pertinent sections of the QC Form are started before sending a document for technical QC review (Sections 1 – 3, and 4 – 7, as appropriate). The Work Product QC Form is structured to allow multiple reviewers to review various or separate sections of the work product.
    a. Section 1 – General information (i.e., project number, project name, PM, document title)
    b. Section 2 – Document type (i.e., report, letter, work plan, QAPP, permit, HASP, proposal, other)
    c. Section 3 – Items included for review (i.e., text, figures, tables, appendices, field notes, supporting documentation, other)
    d. Section 4 – Text technical review
    e. Section 5 – Figures review
    f. Section 6 – Tables review
    g. Section 7 – Appendices, field notes, supporting documentation review
2. Following technical review of the work product, the reviewer completes Sections 4 – 7 of the QC Form as appropriate. Note: Reviewers use the "track changes" function in Microsoft Word to provide comments and/or suggested edits.
3. For work product to be released to the client as a review draft:
    a. Any necessary revisions or edits must be made by the staff member. (If significant reworking is required, the review process may need to be repeated and documented with a second QC Form).
    b. Section 8 (Review of draft technical edits) of the QC form must be completed before releasing the work product to an Administrative Assistant (AA) for proofreading and preparation of the client review draft.
    c. The AA will complete Section 9 (Admin review draft preparation/proofing) of the QC form once the final review draft is complete.
    d. The PM or PM designee must review the AA-finalized review draft prior to release to the client, and acknowledge by completing Section 10 (PM review of draft approval) of the QC Form.
    e. Upon receipt of client comments, the PM/PM designee should indicate whether revisions/edits are needed by completing Section 11 (Client review draft technical revisions/edits) of the QC Form.
    f. Completion of the client technical revisions/edits (if applicable) should be documented by appropriate technical staff by completing Section 12 (Final technical revisions/edits) of the QC Form.
    g. Once the final document has been created by the AA, the AA must sign off on the QC Form (Section 13).
    h. The PM/PM designee must sign off on the QC Form indicating that a review of the final work product has been completed prior to release to the client (Section 14).
4. For work product to be released as final on projects where client review is unnecessary:
    a. Any necessary revisions or edits must be made by the staff member (If significant reworking is required, the review process may need to be repeated and documented with a second QC Form).
    b. Section 12 of the QC Form must be completed before releasing the work product to an AA for preparation of the final work product.
    c. The AA will complete Section 13 of the QC Form once the final work product is complete.
    d. The PM/PM designee must sign off on the QC Form indicating that a review of the final work product has been completed prior to release to the client (Section 14).
5. The completed QC Form must accompany the final work product to the project file. The PM or PM designee is responsible for ensuring that the QC Form is properly completed and that any necessary follow-up to comments/review is performed and documented.

Quality Control Review Process for Work Product Documents



ARTICLE 4: REGULATORY KNOWLEDGE

Include a brief description of your firm's professional experience in each of the following:

4.1 Michigan environmental statutes related to remedial investigation/action:

Fishbeck has abundant experience working with Michigan's environmental statutes related to remedial investigation/action programs. The following narrative discusses our understanding of Michigan's regulatory framework and our relevant experiences.

Fishbeck has extensive professional experience at sites regulated under Part 111, 201, and Part 213 of NREPA. We have provided examples of some of these sites in the prior experience section of the Professional Questionnaire. Fishbeck's knowledge of these environmental regulations is demonstrated through the preparation of work plans and technical reports that are reviewed and approved by EGLE (including Technical and Program Support [TAPS] teams such as GSI, Incremental Sampling/ISM, In-Situ Review, etc.) and achieving project endpoints (e.g., Part 213 Closure, Part 201 No Further Action, Part 201 Certificate of Completion). Fishbeck is also experienced with the preparation and implementation of Closure Plans related to facilities regulated under State Groundwater Discharge Permits per Rule 323.2226(4)(b) of the Part 22 Rules promulgated under Part 31 of Michigan's Public Act 451 of 1994, as amended (Part 31). With remediation projects also involving air discharges, Fishbeck also involves staff specializing in Michigan's Part 55 Permit to Install (PTI) program as well as Rule 290 and Rule 291 PTI exemptions. Fishbeck staff have extensive experience with Part 13 (floodplain permits), Part 31 and the associated Part 22 Rules (surface water discharge/NPDES and groundwater discharge permits), Part 91 (soil erosion and sedimentation control permits), Part 111 (proper handling and disposal of hazardous wastes), Part 115 (management of non-hazardous solid waste), Part 121 (management of liquid industrial by-products), and Part 303 (wetland permits).

Fishbeck staff keep abreast of the Part 201/Part 213 statues and the associated administrative rules through close interaction with EGLE staff, attendance at EGLE training events (as well as EGLE partners such as ITRC), and involvement with professional organizations such as the Michigan Association of Environmental Professionals (MAEP) and American Institute of Professional Geologists (AIPG), with Fishbeck staff active members of both organizations.

Fishbeck staff who routinely complete work on Part 213 sites understand the risk assessment approach that is hallmarked by Michigan's LUST regulations. We have ample experience utilizing the RBCA methodology and have implemented this approach since it became mandatory in 1994. Several Fishbeck employees were former Certified Underground Storage Tank Professionals (CPs) and have received ASTM RBCA training.

4.2 Federal regulations and environmental statutes related to remedial investigation/action:

Fishbeck also has abundant professional experience related to federal regulations pertaining to remedial investigation and action programs. The primary federal programs related to remedial investigation/action is CERCLA and RCRA. These programs set up the foundation for liability and response action to uncontrolled or abandoned hazardous waste sites and emergency releases of contaminants and contaminated sites subject to RCRA corrective action. An undercurrent of these federal programs is the concept of risk assessment, including human health and ecological risk assessments.

Our staff has extensive experience working on CERCLA and RCRA projects and has completed all of the required regulatory phases. The following is a list of the key work products/phases of federal remediation projects performed by Fishbeck:

CERCLA Projects:

- Preliminary assessments
- RI work plans (HASPs, SAP, data management, QAPP)
- RI report (including risk assessment)
- Removal actions
- Feasibility studies
- Alternatives array
- Design documents (specifications, drawings, contract documents)
- Remedial construction quality plans
- Closure plans/documents
- Long-term monitoring plans and reports

- O&M plans
- MNA plans/data evaluation reports

RCRA Correction Action Projects:

- Description of current conditions
- Community management plans
- Project management plans
- RCRA facility investigation work plans and reports
- Interim response work plans and implementation
- Corrective measure studies work plans and implementations
- Interim measures and corrective measures completion reports
- Human health risk assessments and ecological risk assessments (subcontracted to others)
- Monitoring programs

ARTICLE 5: PERSONNEL STAFFING

5.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project provided? ☒Yes ☐No

5.2 Complete the following information regarding the personnel your firm considers key to the successful completion of the study or project scope of work:

Key Personnel 1
Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2
Name: Kerri Miller, PE, LEED AP Job Title: Senior Vice President/Principal
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3
Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4
Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5
Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6
Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7
Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8
Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9
Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10
Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11
Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12
Name: Mike Ranck, PG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13
Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14
Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15
Name: Aaron Bigler Job Title: Environmental Scientist
Labor Classification: P3 College Degree(s): BS in Environmental Science and Planning and Minor in Geographic Information Science, University of Michigan-Flint
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16
Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 17
Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 18
Name: Zachary Curry Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology, Grand Valley State University; Precambrian Research Field Camp, University of Minnesota-Duluth
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 19
Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 20
Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 21
Name: Bailey Hannah Job Title: Hydrogeologist
Labor Classification: P2 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Environmental Science and Sustainability, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 22
Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 23
Name: Brad Peuler, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 24
Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 25
Name: Therese Searles Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology and Environmental Studies, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

5.3 Do the Professional Project Managers (PM) have at least three years experience as a PM? ☒Yes ☐No

5.4 Do the Professional PMs have a minimum of 10 years experience with similar projects? ☒Yes ☐No

5.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 6: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck offers a robust group of in-house professionals, negating the need for professional sub-consultants. We anticipate using the following in-house professionals and expertise to meet project objectives under this contract:

- Licensed Professional Engineers (electrical, mechanical, civil, structural, chemical, and environmental)
- Certified Professional Geologists and Licensed Professional Geologists
- Ecological assessment professionals (e.g. wetland delineation & permitting, endangered species surveys, etc.)
- Architects (AIA)
- Licensed surveyors and geospatial professionals
- Certified Industrial Hygienist & Certified Safety Professional
- Michigan Accredited Asbestos Inspectors, & Accredited Asbestos Contractor Supervisors
- Michigan Certified Stormwater (construction and industrial) and Wastewater Operators

Fishbeck maintains relationships with numerous contracting firms such as drillers, excavators, spill responders, and laboratories (if EGLE Laboratory cannot provide the analyses needed). Project needs will dictate the type of subcontractor(s) that Fishbeck will secure through competitive bidding processes.

Fishbeck acknowledges that, if selected for this contract, subcontractors will be selected for projects based on specific needs. Their costs will be presented in project specific cost estimates and will not be subject to any markups.

6.1 Identify any consultants/subcontractors that will provide services, including engineering, well drilling, and geophysical testing services. *(Note: If any support must be provided by a consultant/subcontractor, the consultants/subcontractors must indicate their capability and willingness to conduct the work)*:

Sub-Consultant/Subcontractor 1
Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2
Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3
Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

6.2 Are consultants/subcontractors trained in health and safety procedures, including participating in a medical, monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No:

6.3 If a consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience?
☐Yes ☐No

6.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work requested in this RFP for each consultant/subcontractor:

Project 1 Reference Information:
Project Name: N/A
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:
Project Name: N/A
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:
Project Name: N/A
Key Personnels: _____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 7: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. (As examples: any awards or recognition received by the firm or individuals for similar work, special approaches or concepts developed by the firm appropriate to this project, financial capacity, etc. Respondents may say anything they wish in support of their qualifications).

Fishbeck provides high-end, innovative, technical solutions for projects that have included active remediation, hazardous condition abatement, risk mitigation of potential exposure to human health or the environment, and site closures. We couple this innovation with a customer service-centered approach. It is this innovation, commitment to meeting client's needs, and consistency of delivering quality work products that has led some of our largest clients to invite us to work at sites throughout the country.

Specialized Experience and Technical Competence

Fishbeck has a well-rounded staff in all the major disciplines required to perform the services that would fall under this contract. The staff includes specialized expertise and competencies in the necessary areas of practice. Specifically, the project team described herein includes hydrogeologists and engineers that specialize in developing data quality objectives (DQOs), sampling and analyses planning, complex site investigations and characterization, aquifer hydraulics, groundwater modeling, extraction well and aquifer performance analysis, groundwater surface water interactions, and fate and transport of contamination. Fishbeck is uniquely experienced with in situ remediation technologies; natural attenuation evaluation; groundwater monitoring; volatilization to indoor air assessments and mitigation; vapor mitigation system design, installation, and operation maintenance; and cost benefit analysis for assessing available options to address environmental issues. Fishbeck routinely prepares and maintains databases for projects generating large amounts of data whose value is lost or diminished when stored using spreadsheets and file geodatabases. Projects such as these require the use of database and GIS applications to effectively manage, evaluate, and present the data.

Project Team and Qualifications

We intentionally seek out and hire well-qualified staff and support them with training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications and best management practices. We have a dedicated staff of scientists, geologists, hydrogeologists, engineers, geographers, and regulatory specialists that help us evaluate the many facets to solving environmental problems in a cost-effective manner that ultimately deliver value to our clients and improves the environment and its benefit to the community. Please see the matrix in the Personnel section for individual key personnel experience and expertise. Staff in our Environmental Services Division hold the following credentials:

- Certified Professional Geologists, American Institute of Professional Geologists – Michigan
- Licensed Professional Geologist – Indiana
- Professional Engineers – Michigan, Indiana, Kentucky, and Florida
- Professional Wetland Scientists, Society of Wetland Scientists
- Environmental professionals as defined by USEPA All Appropriate Inquiry (AAI) Rule
- ASTM Risk Based Training program required by the State of Michigan
- HAZWOPER, First Aid, and CPR
- Accredited Asbestos Building Inspectors, Michigan Department of Licensing and Regulatory Affairs
- Certified Lead Inspectors and Risk Accessors, Michigan Department of Health and Human Services
- Certified Stormwater Operators (Industrial and Construction sites), certified in Stormwater Management and Soil Erosion, and Sedimentation Control
- Certified Industrial/Commercial Wastewater Operators – Various processes
- Certified Vapor Barrier Inspector
- Certified Gas Vapor Barrier Inspector
- PhD in Environmental Engineering
- PhD in Geological Engineering
- LEED Accredited Professionals
- Residential Builder License – Michigan
- Michigan Class A and B UST System Operator

Many circumstances arise during the completion of environmental and remediation projects that require the assistance of other experts and specialists. Fishbeck's Environmental Services Division is fortunate to be supplemented by other in-house experts. These other areas of expertise include:

- Electrical engineers
- Civil engineers
- Mechanical engineers
- Regulatory program specialists
- Structural engineers
- Industrial hygienists
- Construction estimators
- Construction managers
- Financial specialist
- Information technologists/specialists
- GIS specialists
- Professional surveyors

State Contracting Experience

Fishbeck currently holds ISID contracts for environmental and architectural projects. We are familiar with the contracting process and are excited by the prospect of continuing to provide environmental services to MDTMB and EGLE under the Indefinite Service Indefinite Delivery (ISID) Expanded Environmental Remediation (EER) Services contract.

Fishbeck has worked successfully with MDTMB on numerous State of Michigan projects under various types of contracts and has experience working with multiple state agencies such as the EGLE, Michigan Department of Corrections, Michigan Department of Military and Veteran Affairs, Michigan Economic Development Corporation, Michigan State Housing Development Authority, Michigan Department of Transportation, and Michigan Department of Agriculture. Fishbeck's experience is that the relationship between Fishbeck, MDTMB, and the State lead agency varies depending on the project type and the state lead agency's desires. Fishbeck understands that MDTMB is the administrator of and holds the contracts for state-funded projects, handling aspects of contracting, budgeting, funding, change order management, and documentation. For ISID projects with EGLE as the lead agency, project scope of work and roles and responsibilities are defined at project commencement to ensure common understanding of project objectives and proper coordination and communication. Contract assignment and changes are discussed and approved by the EGLE project manager and processed through the EGLE contract administrator. Project invoices are submitted to EGLE for processing and approval, and contract budget tracking is coordinated with MDTMB. As such, both MDTMB and EGLE are Fishbeck's clients.

Fishbeck understands that ISID EER projects may entail one or more project phases, depending on project scope, and that this may evolve as a project progresses. Upon contract assignment execution, Fishbeck may provide services under any combination of the following phases, corresponding with the project scope of work:

- Phase 100 Environmental Investigation/Study Services: These services may include, but are not limited to, health and safety plan, environmental site assessments, due diligence activities, baseline environmental assessments, due care activities, sampling design, site investigations, interim response, exposure pathway evaluations, pilot testing, feasibility studies, site assessments, corrective action planning, response activity planning, and closure reporting.
- Phase 300 Schematic Design: This phase may include, but not be limited to, conceptual designs, specifications outline, calculations, engineering cost estimating, process flow diagrams, and schematics.
- Phase 400 Design Development: This phase entails development and review of all preliminary and draft design, including, but not limited to calculations, figures, construction specifications, equipment specifications, performance metrics, health and safety considerations, QA/QC measures, and start-up and demonstration requirements.
- Phase 500 Construction Documents and Bidding Documents: This phase includes completion of the 100% design package and incorporation of the appropriate contractual front-end documents (i.e., 50K Spec, DC Spec, or

MICHSPEC). This phase may also include pre-bid meeting, preparation of any addenda, and bid evaluation assistance.

- Phase 600 Construction Administration – Office Services: These services would include the pre-construction meeting, review of cut sheets and contractor submittals, bid quantity tracking, maintenance of shop drawings, as-built drawings, schedule tracking, budget tracking, review of contractor payment requests, punch list, recordkeeping, and final construction summary report.
- Phase 700 Construction Administration – Field Services: These services may include construction oversight, field testing and monitoring, personnel monitoring, field coordination, daily field reports, progress meetings, collection of contractor-generated documents (e.g. manifests, etc.), and final inspection.
- Phase 900 Operation and Maintenance Services – Remediation Facility: This phase would include, but not be limited to, routine system operation and maintenance, spare replacement parts, waste removal and disposal, progress meetings and reporting, permit monitoring and reporting, utilities, supplies, repair coordination, post-construction site inspections, and emergency service.

QC Documentation - Field Records
Environmental Services Department

Section 1

Project Name	704 / 76 Getty Street - Task 9
Project Number	180851
Project Manager	PAL
Field Personnel	MJT & ADS
Field Date(s)	3/22/21 - 3/26/21

Section 2

Check items included for review:

Field notes	☑	Marked floor areas	☐
Static water level measurements	☐	Air sample analysis tables	☐
Boring logs	☑	Daily checklist	☐
Aquifer tests	☐	Fungal assessment form	☐
Hydraulic conductivity test data	☐	Other:	☐
Sample collection forms	☑		☐
Equipment calibration forms	☑		☐
Chain-of-custody forms	☑		☐

Section 3

Compiled by:

Signature: [signature]

Date: 3/26/21

Section 4

Review comments:

None

Section 5

Reviewed by:

Signature: Penny D Mahler

Date: 3/29/21

Section 6

Action Taken:

Section 7

Field Record Review Complete:

Signature: _____

Date: _____

FIELD NOTES

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Site Location: Muskegon, MI

Date: 3/22/21

Weather Conditions: Sunny, windy, 54°

Purpose: Monitoring Well Installations

08:35 MJI onsite. checked-in at the east gate.
09:45 Stearns Drilling onsite.
10:00 Going over boring locations and where to stage drill cuttings and development H_2O.
10:30 Stearns (Gary + Brian) is unloading the CME LCX55 drill rig and associated equipment. Drilling will be performed w/ 4.25" HSAs. Drill cuttings and H_2O will be containerized in 55-gallon drums.
10:45 Stearns is setting up at MW-116 (SW corner of former Coal Pile Area).
11:30 Stearns is set-up to drill MW-116; they are taking a quick lunch.
12:25 Stearns Drilling back from lunch. Preparing to blind drill to 30' bgs and then split spoons will be collected every 10' - (30-32'); (40-42'); (50-52'). Continuous split spoon sampling will occur from 60-70'+ bgs.
12:30 Calibrating the MiniRae 3000 PID (#677) to 100ppm isobutylene span gas.
13:30 Drilled down to 50' bgs, so far. The upper 35' of fine grained sand was vibrant orange in color.
14:15 Starting to continuously split spoon from 60' down to

Completed by: [signature] (signature)

3/22/21 (date)

FIELD NOTES

Project Name: TDY/76 Getty Street Site Task 9
Project Number: 180851
Site Location: Muskegon, MI
Date: 3/22/21

Weather Conditions: Sunny, breezy, 64°

Purpose: Monitoring Well Installations

The Clay unit
14:25 Collected a soil sample at the 60-61' interval for TOC (Walkley Black method) analysis.
14:45 Encountered Silty Clay @ ~65.5' bgs.
15:00 Encountered fat clay @ 66.5' bgs.
15:10 Stearns is drilling out the basket and preparing to install a 2" sch. 40 PVC well equipped w/ a 5', 10-slot screen set at the 60-65' interval.
15:25 Checking PID calibration.
17:00 Stearns finished sand packing MW-116 as well as installing the 3/8 Holeplug seal. See boring log for details. The soil drums (3 so far) have been labeled as Non-Haz and transported over to the oil house (along interior west wall).
17:15 MJI and Stearns offsite.

Completed by: [signature] (signature)
3/22/21 (date)

FIELD NOTES

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Site Location: Muskegon, MI

Date: 3/23/21

Weather Conditions: Cloudy, 46° a.m.
Partly sunny, breezy, 70° p.m.

Purpose: Monitoring Well Installations

07:25 MJI onsite. Checked-in at the east gate. Stearns Drilling onsite.
08:00 Stearns is preparing to tremie grout MW-116.
09:00 Finished grouting the well and pulling augers. Stearns will steam clean the augers and containerize the H_2O.
09:30 Stearns finished steam cleaning the augers and are starting to load equipment
10:30 Arrived at MW-115 located near the NE corner of the waste water building on the north side of the perimeter fence. 20-VP104 is close to MW-115.
11:00 Calibrating the MiniRae 3000 PID (#677) to 100ppm isobutylene span gas. Starting to blind drill to 30' prior to split spoon sampling.
11:35 Stearns is taking lunch. Drilled down to 38' bgs, so far.
12:20 Stearns back from lunch. Starting to drill again.
13:05 Collected a soil sample at the 60-61' interval for TOC analysis (Walkley Black method).
13:55 Encountered Clay @ ~ 67' bgs.
14:05 Finished drilling to a total depth of 70' bgs. Stearns is drilling out the basket in preparation of well

Completed by: [signature] (signature)
3/23/21 (date)

FIELD NOTES

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Site Location: Muskegon, MI

Date: 3/23/21

Weather Conditions: Sunny, breezy, 72°

Purpose: Monitoring Well Installations

installation. MW-115 will be constructed of 2" sch. 40 PVC ~~scraped~~ equipped w/ 5', 10-slot PVC screen set at the 62-67' interval.

14:30 Checking PID calibration.

15:35 Stearns finished sand packing and sealing the (3/8 hole plug) MW-115. Preparing tremie grout to finish the well.

16:30 Finished grouting the well and pulling augers out of the ground. Starting to clean-up around MW-115 and head back onsite to decon augers.

17:05 Finished filling ~400 gallons of hydrant H_2O into Stearns' support truck water tank. Augers will be steam cleaned tomorrow - cleaning up for the day.

17:20 MJI and Stearns offsite.

* 5 soil drums from MW-116
* 4 soil drums from MW-115

Completed by: [signature] (signature)

3/23/21 (date)

FIELD NOTES

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Site Location: Muskegon, MI

Date: 3/24/21

Weather Conditions: Lt. rain, 56° a.m.
Mostly sunny, windy, 61° p.m.

Purpose: Monitoring Well Installations

07:25 MJI and Stearns onsite. Checked-in at the east gate.
07:45 Stearns will steam clean the augers from yesterday.
08:40 Stearns finished decon'ing the augers. Heading offsite to develop MW-115 w/ a submersible pump and install the flushmount cover.
09:40 Starting to develop MW-115.
10:15 Collecting a soil sample (composite) for waste characterization.
10:35 Finished developing ~ 65 gallons out of MW-115. Stearns will cement the flushmount cover on their way offsite at the end of the job. Heading over to MW-116 for well development.
10:55 Arrived at MW-116. The grout settled to ~ 17' bgs — Stearns is mixing a batch of grout to finish sealing the well prior to development.
11:50 Stearns is developing MW-116 w/ a submersible pump. Meanwhile, soil + H_2O drums are getting staged inside of the oil house along the west wall.
12:35 Finished developing ~ 100 gallons out of MW-116 and staging most of the 55 gallon drums. Stearns is cleaning up around the work area.

Completed by: [signature] (signature)
3/24/21 (date)

Field Notes

Project Name: TDY/McGetty St. Site - Task 9

Project No.: 180851

Site Location: Muskegon, MI

Date: 3/24/21

Weather Conditions:

Purpose: Monitoring Well Installations

13:45 Stearns is taking lunch and getting redi-mix cement for flushmount installations.
14:30 Stearns is cementing in the flushmount at MW-115.
15:10 Stearns is " " " " MW-116.
16:05 MJ I and Stearns offsite.

Completed by: [signature] (signature)

3/24/21 (date)

Field Notes

Project Name: TAY/76 GETTY ST. - TASK 9

Project No.: 180051

Site Location: MUSKEGON, MI

Date: 3/26/21

Weather Conditions: MIST. CLOUDY, BREEZE, 30s

Purpose: TASK 9: MW-115 & 116 GW SAMPLING.
TASK 2: SVE O&M

0830: CAL'D YSI & TURB. @ HOUSE.
1040: APS ONSITE.
1245: FINISHED GW SAMPLING / EOD CAL V.
1300: COMPLETED QUEB.
1315: DUMPED ~ 5 GAL OF PURGE H2O INTO MANHOLE N OF SVE SYSTEM.
1330: TASK 2 SVE O&M
1330: FLUSHED SMALL AMOUNT OF RADON FROM V3 BY CONNECTING V2 DISCHARGE HOSE TO V3 DISCHARGE HOSE AND BLEW DEBRIS FROM V3 INTAKE HOLE
1345: PRESSURE READINGS W/O V3 INLINE: "H2O
H.E. P = 44.26" H2O, V1 P: 41.86", V2 P: 32.92"
1355: PRESSURE READINGS W/ V3 INLINE: "H2O
HE P: 63.48", V1 P: 61.31", V2 P: 52.63", V3 P INTAKE: 24.61", V3 P DIS: 2.710
1420: PRESSURE READING W/ V2 INLINE: "H2O.
HE P = 64.35", V1 P: = 61.95", V3 P INTAKE: 24.48", V3 P DIS: 2.525"

Completed by: _____ (signature)

_____ (date)

PID CALIBRATION LOG

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Date	Time	Initials	Instrument ID Number	Lamp (eV)	"Fresh" Air Calibration Value (ppm)	Span Gas	Lot number/ Expiration Date	Span Gas Value (ppm)	Span Gas Reading (ppm)
3/22/21	12:30	MJI	677	10.6	0.0	Isobutylene	THBJ-248-100-16 05/15/2023	100	100.5
↓	15:25	"	"	"	—	"	"	"	101.6
3/23/21	11:00	"	"	"	0.0	"	"	"	100.3
↓	14:30	"	"	"	—	"	"	"	101.8

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB-~~##~~/MW-115
Project Number:	180851	Start/End Date:	3/15/21 (H.A.) / 3/23/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~ 38' bgs
Driller/Helper:	Brian / Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	1 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)	Well Construction Details
		1	Top Soil / Organics / Trace Gravel, 5YR 3/2 (D. Brown), Dry		Stick-up: NA
			Poorly Graded Sand (SP), Fine to medium sand (80/20), Light olive Brown (2.5Y 5/6), Dry		Casing diameter: 2"
					interval: 0-62'
					material: sch. 40 PVC
			Cleared w/ Hand Auger		Screen diameter: 2"
		5			interval: 62-67'
					material: PVC
					slot size: 10-slot
					Sand Pack type: K+E #1
					interval: 60-67'
					Seal type: 3/8 Holeplug
	H.A.	10			interval: ~~57.5~~ 57.5-60'
					Grout type: Tremie Grout
					interval: 2-57.5'
		15	SAA		
			Blind Drilled to ~~30~~ 28' bgs		
		20			

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-115
Project Number:	180851	Start/End Date:	3/23/21
Project Manager:	PAL	Logged By:	MJL
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~38' bgs
Driller/Helper:	Brian/Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Spl.t Spoon
Borehole Purpose:	MW Installation	PAGE	2 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)	Well Construction Details
		25	Blind Drilled		Stick-up:
		28			Casing diameter: interval: material:
5 7 8 12	1.8	30	Sand: fine grained (SP), dry, loose, very pale brown (10YR 7/4)	0.2	Screen diameter: interval: material: slot size:
		35			Sand Pack type: interval:
		38			Seal type: interval:
4 6 11 16	1.8	40	Sand: fine grained (SP) w/ trace med. grain (10%), saturated @ ~38' bgs, med. dense, yellowish brown (10YR 5/4)	0.5	Grout type: interval:

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-115
Project Number:	180851	Start/End Date:	3/23/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~38' bgs
Driller/Helper:	Brian/Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	3 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)	Well Construction Details
		42			Stick-up:
					Casing
					diameter:
					interval:
					material:
		45			Screen
					diameter:
					interval:
					material:
					slot size:
					Sand Pack
4 8 10 15	1.5		Sand: fine grained (SP), saturated, med. dense, yellowish brown (10YR 5/4)	0.2	type:
		50			interval:
					Seal
					type:
					interval:
					Grout
					type:
					interval:
		55			
		58			Density - Sands (blow counts per foot): very loose: 5 or less; loose: 6-11; med dense: 11-30; dense: 31-50; very dense: > 50
2 2 4 7	1.6		Sand: fine grained (SP), saturated, loose, yellowish brown (10YR 5/4)	5.0	Density - Clays/Silts (blow counts per foot): very soft: <2; soft: 2-4; medium stiff: 4-8; stiff: 8-15; very stiff: 15-30; hard: >30
		60			
3 2 3 8	1.5		Sand: SAA, yellowish brown (10YR 5/4)	4.8	
		62			

Comments: Collected a soil sample at the 60-61' interval for TOC analysis

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-115
Project Number:	180851	Start/End Date:	3/23/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~38' bgs
Driller/Helper:	Brian/Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	4 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)
1 2 3 3	1.5	64	Sand: fine grained (SP), saturated, very loose, yellowish brown, (10YR 5/4)	7.5
				8.4
3 3 6 11	1.6	66		12.6
			Silty Sand: (SM) fine grained w/ little Silt (20%) saturated, loose, light yellowish brown (10YR 6/4)	11.2
3 4 4 7	1.5	68	Clay: (CH) fat Clay, grey (10YR 5/1), dry to sl. moist, med. stiff, high cohes., med. plasticity	0.5
3 5 6 8	1.6	70	- SAA	0.3
			EOB = 70' bgs	

Well Construction Details

Stick-up:

Casing
- diameter:
- interval:
- material:

Screen
- diameter:
- interval:
- material:
- slot size:

Sand Pack
- type:
- interval:

Seal
- type:
- interval:

Grout
- type:
- interval:

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB-116 / MW-116
Project Number:	180851	Start/End Date:	3/15/21 (H.A.) / 3/22/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~39' bgs
Driller/Helper:	Brian / Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	1 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)
		1	Top Soil / organics / crushed coal, 5YR 3/2 (D. Brown)	
		2	Poorly Graded Sand (SP), fine to medium sand (80/20), Yellow Brown (10YR 5/8), Dry	
		3		
		4	Cleared w/ Hand Auger	
		5		
	H.A.	6		
		7		
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		
		16	Blind Drilled to 30' bgs	
		17		
		18		
		19		
		20		

Well Construction Details

- Stick-up: NA
- Casing
  - diameter: 2"
  - interval: 0-60'
  - material: sch. 40 PVC
- Screen
  - diameter: 2"
  - interval: 60-65'
  - material: PVC
  - slot size: 10-slot
- Sand Pack
  - type: K+E #1
  - interval: 58-65'
- Seal
  - type: 3/8 Holeplug
  - interval: 56-58'
- Grout
  - type: Tremie Grout
  - interval: 2-56'

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-116
Project Number:	180851	Start/End Date:	3/22/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~39' bgs
Driller/Helper:	Brian / Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	2 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)	Well Construction Details
		25	Blind Drilled ↓		Stick-up: _____ Casing diameter: _____ interval: _____ material: _____ Screen diameter: _____ interval: _____ material: _____ slot size: _____ Sand Pack type: _____ interval: _____ Seal type: _____ interval: _____ Grout type: _____ interval: _____
		30			
24 75 50 for 5"	1.9	32	Sand: fine grained (SP), dry, very dense, yellowish brown w/bright orange tint (10YR 5/8)	0.4	
		35			Density - Sands (blow counts per foot) very loose: 5 or less loose: 6-11 med dense: 11-30 dense: 31-50 very dense: > 50
		40			Density - Clays/Silts (blow counts per foot) very soft: <2 soft: 2-4 medium stiff: 4-8 stiff: 8-15 very stiff: 15-30 hard: >30
6 10	2.0		Sand: fine grained (SP), saturated @ ~39' bgs, dense	0.2	

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-116
Project Number:	180851	Start/End Date:	3/22/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~39' bgs
Driller/Helper:	Brian/Gary	Abandonment Method:	
Rig Type:	LCX 55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	3 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)	Well Construction Details
20 26	2.0	42	Sand: fine grained (SP), saturated @ ~39' bgs, dense, very pale brown (10YR 7/4)	0.2	Stick-up:
		45			Casing diameter: interval: material:
		50			Screen diameter: interval: material: slot size:
7 16 29 44	2.0	52	Sand: SAA (SP), saturated, dense, very pale brown (10YR 7/3)	0.3	Sand Pack type: interval:
		55			Seal type: interval:
		60			Grout type: interval:
16 44 60 for 4.5"	1.9	62	Sand: fine to med. grained (SP) (85/15), saturated, dense, pale brown (10YR 6/2)	0.3	

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments:

BORING LOG

Project Name:	TDY/76 Getty Street Site Task 9	Boring/Well Number:	21-SB- MW-116
Project Number:	180851	Start/End Date:	3/22/21
Project Manager:	PAL	Logged By:	MJI
Site Location:	Muskegon, MI	Ground Elevation:	
Contractor:	Stearns Drilling	Static Water Level :	~39' bgs
Driller/Helper:	Brian/Gary	Abandonment Method:	
Rig Type:	LCX55	Development Method:	Submersible Pump
Drilling Method:	4.25" HSAs	Sampling Methods:	Split Spoon
Borehole Purpose:	MW Installation	PAGE	4 OF 4

Blows per 6"	Recovery (feet)	Depth (ft bgs)	Sample Description	PID (ppm)
6 14 25 53	1.9	62 64	Sand: fine grained (SP), saturated, dense, brownish yellow (10YR 6/8)	3.4
18 13 14 14	1.8	66	Sand: SAA	2.0 1.2
3 4 5 6	1.7	68	Silty Clay: (CL/ML), silt (35%), grey brown (10YR 5/2), stiff, low cohes. low-med. plas., very moist Clay: (CH) grey brown (10YR 5/2), med. stiff, high cohes., med. plas., sl. moist EOB = 68' bgs	1.2 0.3

Well Construction Details

- Stick-up:
- Casing: diameter: / interval: / material:
- Screen: diameter: / interval: / material: / slot size:
- Sand Pack: type: / interval:
- Seal: type: / interval:
- Grout: type: / interval:

Density - Sands (blow counts per foot)

very loose:	5 or less
loose:	6-11
med dense:	11-30
dense:	31-50
very dense:	> 50

Density - Clays/Silts (blow counts per foot)

very soft:	<2
soft:	2-4
medium stiff:	4-8
stiff:	8-15
very stiff:	15-30
hard:	>30

Comments: Collected a soil sample at the 60-61' interval for TOC analysis

SOIL SAMPLE COLLECTION FORM

Project Name:	TDY/76 Getty Street Site -T. 9 MW Install/Sampling	**Sampling Location:**	MW-115 (60-61')
Project Number:	180851	**Sample ID:**	TDYGS-21-03-MW-115 (60-61') ✓
Site Location:	Muskegon, MI		
Weather/Temp:	Mostly sunny, breezy, 70°		

SAMPLING EQUIPMENT/PROCEDURE (if different from work plan)

Split Spoon

PID=5.0 ppm ✓

SAMPLE DESCRIPTION

Sand: fine grained (SP), saturated, loose, yellowish brown ✓ (10YR 5/4)

SAMPLE COLLECTION DATE: 3/23/21 TIME: 13:05 ✓

Duplicate sample collected? YES (NO)

MS/MSD sample collected? YES (NO)

Chain of Custody Number: 6043388 ✓

Quantity	Size	Type	Preservative	Parameters
1	4 oz	Glass	None	TOC (Walkley Black), % solids ✓
			None MeOH	
			None MeOH	
			None MeOH	
			None MeOH	
			None MeOH	

SOIL VOC PREPARATION DATE: TIME:

Not Applicable

Sample wt. + tare	g	Sample wt. + tare	g
Bottle tare wt.	g	Bottle tare wt.	g
Sample wt.	g	Sample wt.	g
Volume MeOH	mL	Volume MeOH	mL
MeOH Lot #		MeOH Lot #	

SAMPLING PERSONNEL

Name (SIGNATURE): [signature] Name (SIGNATURE):

SOIL SAMPLE COLLECTION FORM

Project Name:	TDY/76 Getty Street Site -T. 9 MW Install/Sampling	**Sampling Location:**	MW-116 (60-61')
Project Number:	180851	**Sample ID:**	TDYGS-21-03-MW-116 (60-61') ✓
Site Location:	Muskegon, MI		
Weather/Temp:	Sunny, breezy, 64°		

SAMPLING EQUIPMENT/PROCEDURE (if different from work plan)

Split Spoon

PID = 0.3 ppm ✓

SAMPLE DESCRIPTION

Sand: fine to med. grained (SP) (85/15), saturated, dense, ✓ pale brown (10YR 6/2)

SAMPLE COLLECTION DATE: 3/22/21 TIME: 14:25 ✓

Duplicate sample collected? YES / (NO)

MS/MSD sample collected? YES / (NO)

Chain of Custody Number: G043388 ✓

Quantity	Size	Type	Preservative	Parameters
1	4 oz	Glass	None	TOC (Walkley Black), % solids ✓
			None MeOH	
			None MeOH	
			None MeOH	
			None MeOH	
			None MeOH	

SOIL VOC PREPARATION DATE: TIME:

Not Applicable

Sample wt. + tare	g	Sample wt. + tare	g
Bottle tare wt.	g	Bottle tare wt.	g
Sample wt.	g	Sample wt.	g
Volume MeOH	mL	Volume MeOH	mL
MeOH Lot #		MeOH Lot #	

SAMPLING PERSONNEL

Name (SIGNATURE): [signature] Name (SIGNATURE):

WASTE CHARACTERIZATION SAMPLE COLLECTION FORM

Project Name:	TDY/76 Getty Street-Tasks	Sampling Location:	Drum
Project Number:	180851	Sample ID:	TDYGS-21-03-Waste Characterization(I)
Site Location:	Muskegon, MI		
Weather/Temp:	Mostly cloudy, breezy, 57°		

SAMPLE DESCRIPTION:

Sand: fine grained (SP), saturated, yellowish brown (10YR 5/4)

PID = 2.4ppm

SAMPLING EQUIPMENT/PROCEDURE (If different from work plan)

Spade + Scoop

SAMPLE COLLECTION DATE: 3/24/21 TIME: 10:15 ✓

Duplicate sample collected? YES (NO)

MS/MSD sample collected? YES (NO)

Chain of Custody Number: 6044406 ✓

Quantity	Size	Type	Preservative	Parameters
1	4 oz	Glass	None	TCLP/VOCs ✓
1	8 oz	Glass	None	PCB (EPA 8082), % solids ✓
1	8 oz	Glass	None	Paint Filter Test ✓
1	16 oz	Glass	None	TCLP/RCRA Metals, TCLP/SVOCs (A/BN) ✓
			None MeOH	
			None MeOH	

SAMPLING PERSONNEL

Name (SIGNATURE): [signature] Name (SIGNATURE):

EQUIPMENT CALIBRATION FORM

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Date/Time: 3/26/21 0830

Initials: ~~AS~~

NA = Not Applicable

Parameter	Standard	Lot Number	Units	Measured Value	Measurement Temperature (°C)	Calibration Verification Acceptance Window	Instrument Model/ID Number
pH	4.00	4009470-032920	S.U.	4.00	11.9	3.9 - 4.1	YSI P.Q.
	7.00	4008247-032920	S.U.	7.10		6.9 - 7.1	#705
	10.00	4910C61-010820	S.U.	10.08		9.9 - 10.1	
Specific Conductance	147	SC201005-1D	µmhos/cm	157	10.7	132 - 162	↓
	1412	SC201005-2D	µmhos/cm	1370		1342 - 1484	
	2765	SC201005-3C	µmhos/cm	2734		2628 - 2905	
Eh	Zobell's solution	200BL0NTB54-2	mV	445.9	9.0	438.8 - 458.8	
Dissolved Oxygen	NA	NA	mg/L	9.57	19.9	±10% Theoretical: 9.09	↓
Turbidity	10 NTU	20470134	NTU	10.02	—	9 - 11	L2020T #706

Notes:

EQUIPMENT CALIBRATION VERIFICATION FORM

Project Name: TDY/76 Getty Street Site
Project Number: 180851
Date/Time: 3/26/21 1245
Initials: APS

NA = Not Applicable

Parameter	Standard	Lot Number	Units	Measured Value	Measurement Temperature (°C)	Calibration Verification Acceptance Window	Instrument Model/ ID Number
pH	7.00	SAME AS INITIAL CAL	S.U.	7.10	11.4	6.9 - 7.1	YSI P.Q.
Specific Conductance	1412		µmhos/cm	1404	10.0	1342 - 1484	#705
Eh	Zobell's solution		mV	445.4	10.7	436.2-456.2	
Dissolved Oxygen	NA	NA	mg/L	10.18	13.1	±10% Theoretical: 10.54	
Turbidity	10 NTU		NTU	10.13	NA	9 - 11	L. 2020 T #706.

Notes:

GROUNDWATER SAMPLE COLLECTION FORM - LOW FLOW

Project Name:	TDY/76 Getty Street Site Task 9	Monitoring Location:	MW-116
Project Number:	180851	Sample ID:	TDYGS-21-03-MW-116(I)
Site Location:	Muskegon, MI	Well Type:	2" PVC FM
Weather/Temp:	OVERCAST. 40°	Key Number:	NONE

INSPECTION

Label on well?	(YES) NO / REMEDIED	Is cement pad in good repair?	(YES) NO / REMEDIED
Is reference mark visible?	YES / NO / (REMEDIED)	Is protective casing locked and in good repair?	(YES) NO / REMEDIED
Standing water present?	YES / (NO) / REMEDIED	Is inner cap in place and properly sealing well?	(YES) NO / REMEDIED
Indication of surface runoff in well?	YES / (NO) / REMEDIED	Is well casing in visibly good repair?	(YES) NO / REMEDIED

Repair Notes: ADDED ~75' OF BLUDDER TUBING.

STATIC WATER LEVEL DATE: 3/26/21 TIME: 1213

Top of Casing Elevation:	— ft	Measured with:	(Electronic tape) / Chalked tape / Other:
Depth to Water:	37.79 ft	Well depth verified?	(YES) NO
Elevation of Water:	— ft		

WELL PURGING DATE: 3/26/21 TIME: 1216

Purge Method: PERISTALTIC / (BLADDER) / MICRO BLADDER / OTHER: Pump intake @ 2.5 ft from ____ TOC or ✓ bottom

Equipment No.: 2 I.D. #108 @ 55 psi

Measured well depth: 65.04 ft Screen length: 5 ft Depth to screen midpoint: ____ ft

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (mL/min)	pH (S.U.)	Temp (°C)	Spec Cond (µmhos/cm)	Turbidity (NTU)	Eh (mV)	D.O. (mg/L)
1235	37.93	0.14	440	6.59	12.8	2793	21.1	230	0.16
1238	37.93	0.14	440	6.59	12.8	2796	17.2	230	0.16
1241	37.93	0.14	440	6.59	12.9	2803	13.3	230	0.16
Volume: 2.5	(Gallons)		Stabilization Criteria:	±0.1	±3%	±3%	±10% for values >20	±10 mV	±10%

✓

FIELD ANALYSES DATE: 3/26/21 TIME: 1242

Temperature:	12.8 °C	Carbon Dioxide:	NA mg/L	HACH CA-DT (RL = 10 mg/L)	
pH:	6.58 S.U.	Sulfide (S^{-2}):	NA mg/L	HACH HS-WR (RL = 0.05 mg/L)	
Specific Conductance:	2804 µmhos/cm	Ferrous Iron (Fe^{+2}):	NA mg/L	HACH IR-18C (RL = 0.2 mg/L)	
Eh:	229 mV				
Dissolved Oxygen:	0.15 mg/L				
Turbidity:	12.7 NTU				

300 PSI USED.

SAMPLE COLLECTION DATE: 3/26/21 TIME: 1243 ✓

Sample appearance:	CLEAR	Duplicate sample collected?	YES / (NO)
Collection method:	PERISTALTIC (BLADDER) / MICRO BLADDER / OTHER:	MS/MSD sample collected?	YES / (NO)
Equipment No.:	2	Chain of Custody Number:	604407 ✓
Filter used:	0.45 µm (8100) / 0.45 µm (8200) (NONE)		

Quantity	Size	Type	Filtered	Preservative	Parameters
3	40 mL	Glass	No	HCl	VOCs (EPA 8260) ✓
	125 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	250 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	250 mL	Glass	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	500 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	500 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	1000 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	1000 mL	Glass	Yes No	None HCl HNO_3 H_2SO_4 NaOH	

SAMPLING PERSONNEL

Name (SIGNATURE): Name (SIGNATURE):

GROUNDWATER SAMPLE COLLECTION FORM - LOW FLOW

Project Name:	TDY/76 Getty Street Site Task 9	Monitoring Location:	MW-115
Project Number:	180851	Sample ID:	TDYGS-21-03-MW-115(I)
Site Location:	Muskegon, MI	Well Type:	2" PVC FM
Weather/Temp:	SHOWERS, 38°	Key Number:	NONE

INSPECTION

Label on well?	(YES) / NO / REMEDIED	Is cement pad in good repair?	(YES) / NO / REMEDIED
Is reference mark visible?	YES / NO / (REMEDIED)	Is protective casing locked and in good repair?	(YES) / NO / REMEDIED
Standing water present?	YES / (NO) / REMEDIED	Is inner cap in place and properly sealing well?	(YES) / NO / REMEDIED
Indication of surface runoff in well?	YES / (NO) / REMEDIED	Is well casing in visibly good repair?	(YES) / NO / REMEDIED

Repair Notes: ADDED ~75' OF BLADDER TUBING TO WELL.

STATIC WATER LEVEL DATE: 3/26/21 TIME: 1054

Top of Casing Elevation:	— ft	Measured with:	(Electronic tape) / Chalked tape / Other:
Depth to Water:	37.82 ft	Well depth verified?	(YES) / NO
Elevation of Water:	— ft		

WELL PURGING DATE: 3/26/21 TIME: 1105

Purge Method: PERISTALTIC / (BLADDER) / MICRO BLADDER / OTHER: Pump intake @ 2.5 ft from ____ TOC or ✓ bottom

Equipment No.: 2 I.D. #108 @ 55 psi

Measured well depth: 66.21 ft Screen length: 5 ft Depth to screen midpoint: ____ ft

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (mL/min)	pH (S.U.)	Temp (°C)	Spec Cond (µmhos/cm)	Turbidity (NTU)	Eh (mV)	D.O. (mg/L)
1127	38.00	0.18	440	6.92	11.9	1802	20.2	245	0.25
1130	38.00	0.18	440	6.92	11.8	1806	15.6	242	0.24
1133	38.00	0.18	440	6.92	11.9	1786	12.2	239	0.23
Volume: 2.9 (Gallons)			Stabilization Criteria:	±0.1	±3%	±3%	±10% for values >20	±10 mV	±10% ✓

FIELD ANALYSES DATE: 3/26/21 TIME: 1134

Temperature:	11.9 °C	Carbon Dioxide:	NA mg/L	HACH CA-DT (RL = 10 mg/L)	
pH:	6.92 S.U.	Sulfide (S^{-2}):	NA mg/L	HACH HS-WR (RL = 0.05 mg/L)	
Specific Conductance:	1785 µmhos/cm	Ferrous Iron (Fe^{+2}):	NA mg/L	HACH IR-18C (RL = 0.2 mg/L)	
Eh:	238 mV				
Dissolved Oxygen:	0.23 mg/L				
Turbidity:	11.7 NTU				

300 psi USED.

SAMPLE COLLECTION DATE: 3/26/21 TIME: 1135 ✓

Sample appearance:	CLEAR	Duplicate sample collected?	YES / (NO)
Collection method:	(PERISTALTIC) / (BLADDER) / MICRO BLADDER / OTHER:	MS/MSD sample collected?	YES / (NO)
Equipment No.:	2	Chain of Custody Number:	604407 ✓
Filter used:	0.45 µm (8100) / 0.45 µm (8200) / (NONE)		

Quantity	Size	Type	Filtered	Preservative	Parameters
3	40 mL	Glass	No	HCl	VOCs (EPA 8260) ✓
	125 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	250 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	250 mL	Glass	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	500 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	500 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	1000 mL	Plastic	Yes No	None HCl HNO_3 H_2SO_4 NaOH	
	1000 mL	Glass	Yes No	None HCl HNO_3 H_2SO_4 NaOH	

SAMPLING PERSONNEL

Name (SIGNATURE): Name (SIGNATURE):

WATER FIELD BLANK FORM

Project Name: TDY/76 Getty Street Site Task 9

Project Number: 180851

Site Location: Muskegon, MI

TRIP BLANKS

Field ID: _____

COC No.: _____

Date: _____

Quantity	Size	Type	Preservative	Parameters
	40 mL	Glass vial	None HCl	

Field ID: _____

COC No.: _____

Date: _____

Quantity	Size	Type	Preservative	Parameters
	40 mL	Glass vial	None HCl	

Field ID: _____

COC No.: _____

Date: _____

Quantity	Size	Type	Preservative	Parameters
	40 mL	Glass vial	None HCl	

EQUIPMENT BLANKS

Field ID: TDYGS-21-03-QCEB

COC No.: 6044407 ✓

Date/Time: 3/26/21 1300 ✓

Collection method: Bailer / Grundfos / Peristaltic / (Bladder) / Whale / Other:

Equipment #: 2

Collect at a rate of 1 per 20 bladder wells

Quantity	Size	Type	Filtered	Preservative	Parameters
3	40 mL	Glass vial	No	HCl	VOCs (EPA 8260) ✓
			Yes No	None HCl HNO_3 H_2SO_4 NaOH	

Field ID: _____

COC No.: _____

Date/Time: _____

Collection method: Bailer / Grundfos / Peristaltic / Bladder / Whale / Other:

Equipment #: _____

Collect at a rate of 1 per 20 bladder wells

Quantity	Size	Type	Filtered	Preservative	Parameters
			Yes No	None HCl HNO_3 H_2SO_4 NaOH	
			Yes No	None HCl HNO_3 H_2SO_4 NaOH	

Field ID: _____

COC No.: _____

Date/Time: _____

Collection method: Bailer / Grundfos / Peristaltic / Bladder / Whale / Other:

Equipment #: _____

Collect at a rate of 1 per 20 bladder wells

Quantity	Size	Type	Filtered	Preservative	Parameters
			Yes No	None HCl HNO_3 H_2SO_4 NaOH	
			Yes No	None HCl HNO_3 H_2SO_4 NaOH	

SAMPLING PERSONNEL

Name (SIGNATURE): [signature]

Name (SIGNATURE): _____

CHAIN OF CUSTODY RECORD

Fishbeck, Thompson, Carr & Huber, Inc.
Address
Phone

Report to Penni Mahler
Email pdmahler@fishbeck.com
Copy to
Email

Invoice to Accounts Payable
Email acpay@fishbeck.com
Lab Quote Reference

WO#: 50283244
50283244

1 OF 1

PROJECT NAME	PROJECT NO.
TDY/76 Getty St. - Task 9	180851
PROJECT LOCATION: Muskegon, MI	SAMPLER(S) NAME: MJI
PROJECT MANAGER: PAL	PHONE
	EMAIL
ADDITIONAL INFORMATION	

Analyses: TOC (Walkley Black); % Solids
PRESERVATIVE: None

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID/SEMI-SOLID	AIR	NONAQUEOUS LIQUID	NUMBER OF CONTAINERS SUBMITTED (None)	REMARKS
3/22/21	14:25	TDYGS-21-03-MW-116 (60-61') I		✓			1	
3/23/21	13:05	TDYGS-21-03-MW-115 (60-61') I		✓			1	

RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	METHOD OF SHIPMENT/BILL OF LADING
[signature]	3/25/21	14:25							
RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED FOR LAB: D. Nardin 3/25/21 14:25

WHITE Copy — Return with data package. YELLOW Copy — field File / Project Documentation.

G 043388

fishbeck

CHAIN OF CUSTODY RECORD

1515 Arboretum Drive SE, Grand Rapids, MI 49546
616.575.3824 | www.fishbeck.com

Report to Jenni Mahler
Email pdmahler@fishbeck.com
Copy to
Email

Invoice to acpay@fishbeck.com

WO# : 50283272

50283272

PROJECT NAME	PROJECT NO.
TDY/Hobetty St.-Task 9	180851
PROJECT LOCATION	SAMPLER(S) NAME
Muskegon, MI	MJI
PROJECT MANAGER	PHONE
PAL	EMAIL
ADDITIONAL INFORMATION	

STD TAT ☑
RUSH TAT ☐
DATE DUE:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: AQUEOUS (WATER)	MATRIX: SOLID/SEMI-SOLID	MATRIX: AIR	MATRIX: NONAQUEOUS LIQUID	REQUIRED ANALYSES: TCLP VOCs	PCB (8082) % Solids	Paint Filter Test	TCLP/RCRA Metals	TCLP SVOCs (A/BN)						
							PRESERVATIVE: None	None	None	None							
							NUMBER OF CONTAINERS SUBMITTED										
3/24/21	10:15	TDYGS-21-03-Waste Characterization (I)		✓			1	1	1	1							

REMARKS
8193 | 7

RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	METHOD OF SHIPMENT/BILL OF LADING
	3/25/21	14:25							
RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED FOR LAB / DATE / TIME
									3/25/21 14:25

WHITE Copy — Return with Data Package YELLOW Copy — Field File / Project Documentation

G № 044406

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CHAIN OF CUSTODY RECORD

1515 Arboretum Drive SE, Grand Rapids, MI 49546
616.575.3824 | www.fishbeck.com

Report to _____ Invoice to acpay@fishbeck.com
Email _____
Copy to _____ Lab Quote
Email _____ Reference _____

PROJECT NAME	PROJECT NO.	MATRIX TYPE	REQUIRED ANALYSES	PAGE 1 OF 1
Toy/Getty Street Task 9	180851			
PROJECT LOCATION: Muskegon, MI	SAMPLER(S) NAME: APS			STD TAT ☒
PROJECT MANAGER: PAL	PHONE / EMAIL			RUSH TAT ☐
ADDITIONAL INFORMATION				DATE DUE:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	AQUEOUS (WATER)	SOLID/SEMI-SOLID	AIR	NONAQUEOUS LIQUID	VOCs (EPA 8260)	REMARKS
							PRESERVATIVE: HCl	
							NUMBER OF CONTAINERS SUBMITTED	
3/26/21	1135	TOYGS-21-03-MW-115(I)	X				3	
	1243	TOYGS-21-03-MW-116(I)	X				3	
	1300	TOYGS-21-03-QLEB	X				3	

RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	METHOD OF SHIPMENT/BILL OF LADING
APS	3/26/21	1525							
RECEIVED BY	**DATE**	**TIME**	**RECEIVED BY**	**DATE**	**TIME**	**RECEIVED BY**	**DATE**	**TIME**	**RECEIVED FOR LAB** / **DATE** / **TIME**
									3-26-21 1525

WHITE Copy — Return with Data Package YELLOW Copy — Field File / Project Documentation

G № -044407

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Engineers | Architects | Scientists | Constructors

1515 Arboretum Drive, SE
Grand Rapids, Michigan 49546

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Weekly Field Activity Summary

PROJECT NAME:	76 Getty Street, Muskegon, Michigan		
PREPARED BY:	Chad A. Weber, PE	PROJECT NO.:	180851/Task 9
FIELD STAFF:	Mike Ingersoll (MJI), Alex Sackett (APS)		
WORK PERIOD:	March 22-26, 2021		
TASK SUMMARY:	Monitoring Well Installation, Soil Sampling, Groundwater Sampling at MW-115/MW-116		

Monday – March 22, 2021 (MJI)
Fishbeck onsite 08:35 to 17:15
Subcontractors: Stearns Drilling mobilization, onsite 09:45 to 17:15
Drilling activities: Drilled/installed MW-116; boring advanced to 68 ft bgs, installed 2-inch well screened 60-65 ft
Sampling activities: TOC sample collected 60-61 ft, PID screening
IDW generated: 5 drums soil (staged at Oil House building)

Tuesday – March 23, 2021 (MJI)
Fishbeck onsite 07:25 to 17:20
Subcontractors: Stearns Drilling onsite 07:25 to 17:20
Drilling activities: Finished grouting MW-116; drilled/installed MW-115; boring advanced to 70 ft bgs, installed 2-inch well screened 62-67 ft
Sampling activities: TOC sample collected 60-61 ft, PID screening
IDW generated: 4 drums soil (staged at Oil House building)

Wednesday – March 24, 2021 (MJI)
Fishbeck onsite 07:25 to 16:05
Subcontractors: Stearns Drilling onsite 07:25 to 16:05, demobilization
Drilling activities: Developed MW-115/MW-116; installed flush well covers set in concrete
Sampling activities: IDW soil waste characterization for TCLP VOC/SVOC/metals, PCBs, free liquids
IDW generated: 3 drums groundwater (staged at Oil House building)

Thursday – March 25, 2021
No activities; field work paused for well stabilization

Friday – March 26, 2021 (APS)
Fishbeck onsite 08:30 to 16:20
Subcontractors: None
Sampling activities: Low flow groundwater sampling from MW-115 and MW-116 using bladder pump, sample analysis for VOCs (refer to Task 2 file for SVE O&M activities)
IDW generated: placed in sanitary sewer manhole per MCWMS industrial discharge permit

Attachments
Field notes, boring logs, sampling sheets, COC

Copy
Peter A. Lepczyk, CPG – Fishbeck

Part II – Cost

Billing Rate Information

This cost proposal outlines the billing rates (from 2023 to 2028) of key personnel and other employees whose involvement on projects is anticipated. Since we have worked under these contracts before, we are familiar with the fee structure and reimbursable expenses.

Subcontractor fees have not been included, since these costs depend on individual tasks on specific projects and will be provided once the scope of services for a project is determined.

POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION
ISID - 2023 EXPANDED ENVIRONMENTAL REMEDIATION SERVICES

Professional's Name	**Fishbeck**
Yearly Percentage Billing Rate Increase	**3%**

Employee Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Year 2028
Deb Alderink, CIH, RN	P4 – Occupational Safety and Health Manager	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Mike Apgar**	P4 – Senior Environmental Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Al Aspacher, PE	P4 – Senior Project Manager	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Tony Bartol, PS	P4 – Senior Surveyor	$163	$167.89	$172.93	$178.11	$183.46	$188.96
David Bohan	P4 – Senior Hydrogeologist	$140	$144.20	$148.53	$152.98	$157.57	$162.30
Tom Budge, CHMM	P4 – Senior Environmental Specialist	$163	$167.89	$172.93	$178.11	$183.46	$188.96
Todd Campbell, CPG**	P4 – Senior Geologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
David Conklin, PE	P4 – Senior Water and Wastewater Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Rick Dunkin, CPG, LPG**	P4 – Senior Geologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
David Filipiak, CHMM**	P4 – Environmental Engineer/Environmental Chemist	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Paul French**	P4 – Senior Hydrogeologist	$140	$144.20	$148.53	$152.98	$157.57	$162.30
Bruce Gillett, CPG**	P4 – Senior Hydrogeologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Jeffrey Hawkins	P4 – Senior Hydrogeologist	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Peter Lepczyk, CPG**	P4 – Senior Hydrogeologist	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Alisa Lindsay, PE**	P4 – Senior Environmental Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Liz Marsh, PE, CHMM	P4 – Senior Environmental Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Brian McKissen, PE, CFM	P4 – Senior Civil Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Kerri Miller, PE, LEED AP**	P4 – Principal	$195	$200.85	$206.88	$213.08	$219.47	$226.06
Kyle Murray, PhD	P4 – Senior Hydrogeologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Ryan Musch, PE	P4 – Senior Civil Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Erik Peterson	P4 – Senior Hydrogeologist	$132	$135.96	$140.04	$144.24	$148.57	$153.02
Brad Peuler, CPG**	P4 – Senior Geologist	$140	$144.20	$148.53	$152.98	$157.57	$162.30
Kelli Piper, CHMM	P4 – Senior Environmental Specialist	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Mike Ranck, PG**	P4 – Senior Hydrogeologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28

POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION
ISID - 2023 EXPANDED ENVIRONMENTAL REMEDIATION SERVICES

Professional's Name Fishbeck

Yearly Percentage Billing Rate Increase 3%

Employee Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Year 2028
Andrew Schwallier	P4 – Senior GIS Specialist	$127	$130.81	$134.73	$138.78	$142.94	$147.23
Claire Schwartz, PE	P4 – Senior Civil Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Lynn Spurr	P4 – Senior Environmental Specialist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
David Stegink	P4 – Brownfield Program Manager	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Elise Hansen Tripp, PWS	P4 – Senior Wetland Scientist/Ecologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
David Warwick**	P4 – Senior Hydrogeologist	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Jess Watterson**	P4 – Senior Environmental Scientist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Chad Weber, PE**	P4 – Senior Environmental Engineer	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Robert Webster	P4 – Senior Geologist	$104	$107.12	$110.33	$113.64	$117.05	$120.56
Susan Wenzlick	P4 – Senior Brownfield Specialist	$146	$150.38	$154.89	$159.54	$164.32	$169.25
Roman Wilson	P4 – Brownfield Program Manager	$180	$185.40	$190.96	$196.69	$202.59	$208.67
Jacob Abair	P3 – Senior Chemical Engineer	$140	$144.20	$148.53	$152.98	$157.57	$162.30
Aaron Bigler**	P3 – Environmental Scientist	$92	$94.76	$97.60	$100.53	$103.55	$106.65
Chris Carew**	P3 – Senior Geologist	$122	$125.66	$129.43	$133.31	$137.31	$141.43
Courtney Dunaj	P3 – Hydrogeologist	$118	$121.54	$125.19	$128.94	$132.81	$136.79
Becky Flasck, CHMM	P3 – Senior Environmental Specialist	$127	$130.81	$134.73	$138.78	$142.94	$147.23
Mark Gatrell	P3 – Operations Manager	$152	$156.56	$161.26	$166.09	$171.08	$176.21
Cody Green	P3 – Health and Safety Manager	$152	$156.56	$161.26	$166.09	$171.08	$176.21
Joel Henry**	P3 – Senior Hydrogeologist	$165	$169.95	$175.05	$180.30	$185.71	$191.28
Derrick Lingle, CPG**	P3 – Senior Hydrogeologist	$140	$144.20	$148.53	$152.98	$157.57	$162.30
Adam Near, CPG	P3 – Senior Geologist	$127	$130.81	$134.73	$138.78	$142.94	$147.23
Alyssa Olson	P3 – Hydrogeologist	$122	$125.66	$129.43	$133.31	$137.31	$141.43
Kirk Perschbacher	P3 – Senior Brownfield Specialist	$146	$150.38	$154.89	$159.54	$164.32	$169.25
Cheryl Pitchford	P3 – Senior Civil Engineering Specialist	$136	$140.08	$144.28	$148.61	$153.07	$157.66

POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION
ISID - 2023 EXPANDED ENVIRONMENTAL REMEDIATION SERVICES

Professional's Name	**Fishbeck**
Yearly Percentage Billing Rate Increase	**3%**

Employee Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Year 2028
Josh Schroedter	P3 – Industrial Hygienist	$103	$106.09	$109.27	$112.55	$115.93	$119.41
Therese Searles**	P3 – Senior Geologist	$118	$121.54	$125.19	$128.94	$132.81	$136.79
Fernanda Wilson, PhD**	P3 – Environmental Engineer	$122	$125.66	$129.43	$133.31	$137.31	$141.43
Zachary Curry**	P2 – Geologist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Ali Dahlbacka**	P2 – Environmental Engineer	$114	$117.42	$120.94	$124.57	$128.31	$132.16
Alex Frye	P2 – Geologist	$98	$100.94	$103.97	$107.09	$110.30	$113.61
Bryana Guevara	P2 – Wetland Scientist/Arborist	$122	$125.66	$129.43	$133.31	$137.31	$141.43
Stephanie Hanes	P2 – Environmental Engineer	$109	$112.27	$115.64	$119.11	$122.68	$126.36
Bailey Hannah**	P2 – Hydrogeologist	$98	$100.94	$103.97	$107.09	$110.30	$113.61
Ryan Krozek	P2 – Occupational Safety and Health Services	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Justin Levande	P2 – Chemical Engineer	$122	$125.66	$129.43	$133.31	$137.31	$141.43
Penni Mahler	P2 – Environmental Data Specialist	$98	$100.94	$103.97	$107.09	$110.30	$113.61
Marley McVey	P2 – Environmental Engineer	$109	$112.27	$115.64	$119.11	$122.68	$126.36
Kayla Rooney**	P2 – Geologist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Alex Sackett	P2 – Geologist	$98	$100.94	$103.97	$107.09	$110.30	$113.61
Nicole Stewart	P2 – Wetland Scientist/Ecologist	$88	$90.64	$93.36	$96.16	$99.04	$102.02
Alex Struble	P2 – Hydrogeologist	$114	$117.42	$120.94	$124.57	$128.31	$132.16
Ariana Wade	P2 – Water and Wastewater Engineer	$109	$112.27	$115.64	$119.11	$122.68	$126.36
Nick Battjes	P1 – Hydrogeologist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Solomon Boisvert	P1 – Environmental Specialist	$80	$82.40	$84.87	$87.42	$90.04	$92.74
Audrey Havens	P1 – GIS Specialist	$68	$70.04	$72.14	$74.31	$76.53	$78.83
Kyle Knaub	P1 – Hydrogeologist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Hailey Lyczynski	P1 – GIS Specialist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Logan Maser	P1 – Environmental Engineer	$92	$94.76	$97.60	$100.53	$103.55	$106.65

POSITION, CLASSIFICATION AND EMPLOYEE BILLING RATE INFORMATION
ISID - 2023 EXPANDED ENVIRONMENTAL REMEDIATION SERVICES

Professional's Name	**Fishbeck**
Yearly Percentage Billing Rate Increase	**3%**

Employee Name	Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Year 2028
Logan Mulholland	P1 – Brownfield Project Analyst	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Mahta Naziri Saeed	P1 – Environmental Engineer	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Madison Schrader	P1 – Hydrogeologist	$80	$82.40	$84.87	$87.42	$90.04	$92.74
Regina Shettler	P1 – Environmental Scientist	$80	$82.40	$84.87	$87.42	$90.04	$92.74
Ryohei Wakabayashi	P1 – Hydrogeologist	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Brenda Bailey	TS – Office Assistant	$80	$82.40	$84.87	$87.42	$90.04	$92.74
Therese Cotter	TS – Administrative Assistant	$92	$94.76	$97.60	$100.53	$103.55	$106.65
Dawn Grates	TS – Administrative Assistant	$98	$100.94	$103.97	$107.09	$110.30	$113.61
Leanne Jeannot	TS – Administrative Assistant	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Shelbey Senkewitz	TS – Environmental Technician	$84	$86.52	$89.12	$91.79	$94.54	$97.38
Michelle Bell	T3 – CAD Technician	$80	$82.40	$84.87	$87.42	$90.04	$92.74
Judy Van Putten	T3 – Technician	$84	$86.52	$89.12	$91.79	$94.54	$97.38

*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate

** Key Project Personnel

Part III – Specialized Technologies Information

Project Matrix

• Technology included in project scope
Project profile in Part II under this technology

PROJECTS		TECHNOLOGY										
Project Summary Location (Part II Qualifications Section)	Project Name	I. Excavation, Dewatering and Offsite Disposal	II. Demolition	III. Migration Control, Fluid Removal and Containment	IV. Landfills	V. Indoor Air/ Vapor Intrusion	VI. In Situ Physical/ Chemical Treatment	VII. In Situ Physical/ Biological Treatment	VIII. Ex-Situ Physical/ Chemical Treatment	IX . Ex Situ Physical/ Biological Treatment	XI. PFAS	XII. Alternative Technologies/ Post Remediation Strategies
III	615 Holdings	•	•			•						
I	Avionics Specialties, Inc. Facility (TDY Avionics)	•		•				•				•
XI	Billerud – Drinking Water PFAS Treatment System										•	
VII	Bradford White Corporation - Source Area Clean-up of a Highly Impacted CVOC Release			•		•	•	•	•			
V	Central Manufacturing Services Logistics, LLC/Clark Logic					•						
XI	City of Grand Rapids/ESTS Relocation Contracts 1&2	•		•					•		•	
XI	City of Grand Rapids/Godfrey Reconstruction	•		•					•		•	
IX	City of Ludington WWTP	•								•	•	•
IX	Forest Hills Public Schools/Eastern Operations									•		
XII	Former Detrex Facility					•	•					•
XII	Former DTE Marysville Power Plant and Greenwood Oil Terminal	•										•
I	Former Harbor Beach Power Plant	•										
IV	Former Jackson County Airport Sanitary Landfill	•			•							
II	Former Sugarloaf Resort	•	•									
VI	Former Teledyne Howell Penncraft Facility	•	•				•	•	•			
III	Former Teledyne Ryan Electronics Site			•				•				•
VII	Former Teledyne Semiconductor and Spectra-Physics Lasers, Inc. Sites (TDY Mountain View)			•			•	•	•			
VI	Graceland Fruit Bonney Disposal Pit	•		•			•					
IV	Harrison Landfill				•							
IV	Ionia Landfill			•	•				•			
V	KALSEE Credit Union	•	•			•						
XII	Lamont Street Fueling	•	•			•						•
VI	MAHLE Industries, Inc. – Harvey Street Facility			•			•		•			•
III	MAHLE Sanford Street Facility			•			•		•			•
II	Metea Court Senior Apartments		•									
VI	Military Equipment Manufacturing Facility Environmental Services (TDY Getty Street)	•		•			•	•	•			•
II	Old Three Rivers Hospital	•	•									
IX	Ott Story Groundwater Treatment System			•					•	•		
III	Pools Prairie Superfund Site Manufacturing Plant Area	•	•	•	•	•	•	•	•			
VII	PS Food Mart – Hillsdale (Convenience King Group)	•		•		•		•				•
VIII	Radiant Services Corporation and Former Teledyne/Aeroquip Site					•	•	•	•			
VIII	Raymond Road Project (Davis Oil Company)	•		•			•		•			•
IV	Reynolds/RPC Red Bluff Landfill				•				•			
XI	Robinson Elementary School – Drinking Water PFAS Treatment and Monitoring										•	
I	Sandy Supply Site Source Area Removal and In-Situ Groundwater Remediation	•	•			•		•				
VIII	Windward Pointe/Pure Muskegon Development			•			•		•		•	

Note: Fishbeck is not pursuing X. In-Situ and Ex-Situ Thermal Treatment as part of this proposal.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Excavation, Dewatering Off-Site Disposal

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Former Harbor Beach Power Plant
Key Personnels: Derrick Lingle CPG, David Warwick
Project Address: 755 North Huron Avenue
Project City/State/Zip: Harbor Beach, Michigan 48441
Owner/Client Contact Name and Telephone #: Adam Peetz – 314.616.0279

Project 1 Description:
Fishbeck was retained to implement site investigation and remedial activities at the former Harbor Beach Power Plant, with the overall goal of pursing a site-wide no further action (NFA) determination without the reliance on a post-closure agreement (i.e., no long-term monitoring). The Harbor Beach Power Plant property consists of approximately 95 acres and is situated along Lake Huron; the facility is located on a manmade peninsula

surrounded by the lake on its north, east, and south sides. Originally owned and operated by DTE Energy, the power plant began operations in 1968 and had the capacity to generate up to 125 MW of power. Demolition activities were conducted in 2019 through 2021 to remove power plant-related infrastructure in support of future redevelopment.

A comprehensive site assessment revealed the presence of contaminants, primarily metals, venting into Lake Huron in excess of generic groundwater surface water interface (GSI) criteria. In addition to traditional evaluation methods (e.g., monitoring well sampling, etc.), pore water sampling and mixing zone-based GSI criteria were utilized by Fishbeck to evaluate exposure risk. Multiple source areas were identified that warranted remedial action. Given the nature of site conditions and desire to achieve closure in an expedited manner, excavation was selected as the desired remedial approach.

The primary source area was the former coal ash pond, which historically covered 18.9 acres. Fishbeck provided remedial design support and oversaw the excavation of over 100,000 cubic yards of coal ash from the former pond for offsite disposal at a licensed facility. The extent of coal ash removal was based on visual observation, with support of a magnet as a field screening tool as well as soil analytical data. Complicating excavation efforts was that the coal ash pond is separated from Lake Huron by manmade embankments. Historically high water levels across the Great Lakes in 2020 presented embankment stability concerns during excavation, particularly for the north embankment where the clay liner did not extend to the excavation floor. Exposed saturated sand at the embankment base posed soil piping risks, similar to the mechanism that caused dam failure along the Tittabawassee River in 2020. Fishbeck was part of a team that designed and implemented dewatering and secondary containment measures out of an abundance of caution to successfully remove coal ash without encountering embankment failure.

After completion of the coal ash pond, Fishbeck oversaw the excavation of sediment from four lagoons that supported the former onsite wastewater treatment plant. Following demolition of the power plant building, further investigation activities identified elevated concentrations of semi-volatile organic compounds in soil that presented a direct contact exposure risk. Fishbeck directed the removal of approximately 5,000 cubic yards of soil for offsite disposal at a licensed facility. Certificates of completion were granted by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for excavation activities in 2020 and 2021.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal

Project 2 Reference Information:

Project Name: Avionics Specialties, Inc. Facility
Key Personnels: Peter Lepczyk, CPG, Michael Apgar, Chris Carew, Fernanda Wilson, PhD, Brad Peuler, CPG, Mike Ranck, PG
Project Address: 3367 Earlysville Road
Project City/State/Zip: Earlysville, Virginia 22936
Owner/Client Contact Name and Telephone #: Mark Thomasen – 302.368.7350

Project 2 Description:
Fishbeck developed and implemented a RCRA facility investigation, interim measures, and corrective measures study for a site impacted with chlorinated solvents and metals. Initial investigation activities included assessing potential AOCs through the collection of soil and groundwater samples and completing a utility inspection and ground penetrating radar survey to identify subsurface conveyances and USTs. The facility is positioned above a groundwater divide with multi-directional groundwater flow away from the site in an unconsolidated water bearing zone and underlying fractured bedrock aquifer. Following the initial investigation, a comprehensive RI was performed using various drilling methods (direct push, hollow-stem auger, air rotary) coupled with downhole camera logging, borehole geophysics, and packer testing. A surficial electrical resistivity survey was performed to identify prominent saturated fractured zones in the bedrock and guide the installation of the bedrock monitoring well network. Characterization of the GSI was performed through pore water sampling, surface water sampling, streamflow measurements, groundwater monitoring adjacent to surface water features, and an ecological risk evaluation. The site work was overseen by the USEPA.

From 2016 through 2022, interim measures were implemented to excavate source areas, replace an existing residential well, perform an SVE pilot study, and perform enhanced reductive dechlorination (ERD). The excavation areas addressed soil impacts identified in three separate AOCs, as determined through approximately 40 soil borings. Excavation areas were adjusted during implementation based on real-time field observations. Approximately 7,800 cubic yards of soil were excavated, transported, and properly disposed at licensed disposal facilities. Wastes included both non-hazardous and characteristically hazardous waste.

Following the excavation activities, ERD was implemented in the unconsolidated aquifer in the vicinity of the three AOCs. Two separate injection events occurred in 2016 and 2019. ERD was performed through the amendment of magnesium hydroxide buffering agents, emulsified vegetable oil (EVO), bioaugmentation, and other nutrients into the unconsolidated aquifer. ERD groundwater monitoring data indicate that reductive dechlorination is occurring and total CVOC mass is reducing. ERD will be carried forward in the corrective measures study, which is in process.

The corrective measures study valuated potential corrective measures alternatives (i.e., feasibility study) for the general site, groundwater, potable water, indoor air, surface water, and sediments. Each alternative was evaluated using balancing criteria of short- and long-term effectiveness; capacity to reduce toxicity, mobility, or volume of wastes; implementability; community and state acceptance; and costs. In consideration of all of the potential corrective measures alternatives and their balancing criteria, the proposed CMS remedial alternatives for the site are:

General – Land use and institutional controls, with administrative measures including annual verification of land use at the affected properties and notifications to appropriate county agencies.

Groundwater – Monitored natural attenuation (MNA) with contingent ERD in the source area. The decision to implement additional ERD will be based on evaluation relative to the ERD metrics.

Potable water supply for former plant property – Various options (e.g. new production well(s), connection to municipal water supply, etc.) depending on future land use.

Indoor air – Groundwater MNA with contingent ERD in the source area and contingent vapor mitigation tools. Future sub-slab vapor and indoor air monitoring to occur to verify VOC concentrations do not exceed acceptable screening levels relative to land use.

Surface water – Groundwater MNA with contingent ERD in the source area.

Sediment – Groundwater MNA with contingent ERD in the source area to prevent unacceptable risk to people in the future through the completion of a feasibility study in accordance with USEPA guidance.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- Indoor Air/Vapor Intrusion

Project 3 Reference Information:

Project Name: Sandy Supply Site Source Area Removal and In Situ Groundwater Remediation
Key Personnels: Peter Lepczyk, CPG, Todd Campbell, CPG, Mike Apgar, Ali Dahlbacka, Mike Ranck, PG
Project Address: 636 Kemrow Avenue
Project City/State/Zip: Wooster, Ohio 44691
Owner/Client Contact Name and Telephone #: Mark Thomasen, REM, CHMM – 302.368.7350

Project 3 Description:
Fishbeck was retained by the Sandy Supply PRP Group to evaluate and modify an environmental cleanup at a site impacted by trichloroethene (TCE). When Fishbeck assumed responsibility, an *in situ* enhanced reductive dechlorination (ERD) groundwater remediation system had been active for six years, but progress toward the cleanup goal had stalled.

Site Characterization – After evaluating the project data, it became clear adequate characterization of the site conditions had not been performed. Specifically, the source area of the TCE contamination had not been

determined. Fishbeck's first task was to find and delineate the contaminant source. Using a Geoprobe soil sampling system and mobile laboratory, a soil boring program was completed that identified the impacted soil's limits. The affected soil was found adjacent to, and partially beneath, a nearby building. A work plan to abate the source area soils and modify the groundwater remediation was prepared and submitted to the Ohio EPA.

Source Removal – Excavation of the contaminated soil was determined to be the most practical and cost-effective alternative for removing the source. Because of the nearby building, a structural engineering evaluation indicated shoring of a main support column was necessary. The project also required demolition of an attached storage building and removal of the main building's foundation footing. Approximately 1,600 tons of impacted soil and debris were removed from the source area and taken to a licensed landfill for disposal. During the excavation operation, an underground storage tank containing high concentrations of TCE in water was discovered. This tank was properly abandoned with oversight from the Ohio State Fire Marshal Office.

Aquifer Remediation – Following restoration of the ground and building wall, a new ERD injection well network was installed. The new wells were needed because the most impacted area was not within the treatment zone of the former network. Fishbeck also changed the organic substrate to emulsified soybean oil because of its significant longevity in the aquifer. A full-scale injection of soybean oil was completed in December 2010. The analytical results from annual sampling indicate residual TCE is continuing to be degraded to its innocuous end product of ethene.

Additional areas of TCE-impacted groundwater were discovered in 2015. Fishbeck is currently conducting high resolution site characterization utilizing membrane interface hydraulic profiling (MIHPT) to delineate the TCE with anticipated injection of emulsified soil bean oil in Summer 2023.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Biological Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has a long history of successfully completing excavation projects including water management (dewatering, stormwater diversion, and pumping), and waste transportation and disposal under state and federal programs. Through historic document review, investigation, strategic planning, design, and implementation of remediation projects, Fishbeck's attention to detail allows for safe and cost-effective solutions that meet our client's excavation, dewatering, and disposal project goals. Our project teams include experienced environmental, structural, civil, and mechanical engineers; geologists; hydrogeologists; and ecologists. The depth and experience of our in-house staff permits us to design all required aspects of excavation, dewatering, and disposal remediation projects including:

- Evaluate investigation results and data to develop remedial strategies.
- Prepare schematic, preliminary, and final designs including excavation areas, depths, and limits.
- Design dewatering systems and procedures.
- Design earth retention/stabilization systems as required to achieve excavation goals.
- Design systems for structural support/protection of existing structures.
- Develop demolition/re-location plans for existing infrastructure and site features within the proposed excavation area.
- Survey existing grades, site features, and property boundaries for protection during construction.
- Design final site grades, restoration, and paving plans.
- Design replacement pavement sections appropriate for intended site use.
- Plan for repair/replacement of site utilities as required to achieve excavation goals.
- Develop construction testing and quality assurance/quality control programs.
- Perform waste characterization of soil and groundwater for disposal.

- Prepare soil erosion and sedimentation control programs.
- Produce design documents, including detailed plans and specifications.
- Prepare and disseminate bidding documents.
- Conduct pre-bidding meetings.
- Respond to questions and issue addendums and bulletins.
- Assist with contractor selection and procurement.

Fishbeck will confirm design and construction efforts comply with state agency requirements as defined by the Michigan Department of Technology, Management and Budget (MDTMB) Design and Construction Division. Fishbeck is well-versed in providing services to MDTMB and the client agencies typically assigned to consultants for execution, including phased contracting procedures. Additionally, Fishbeck is well-versed in completing construction and bidding documents using the current edition of MDTMB MICHSPEC, DCSPEC, or 50KSPEC requirements.

For more detailed information, see resumes in the appendix.

3.2 Construction Oversight:

Fishbeck maintains trained and experienced staff who routinely provide all aspects of oversight services on excavation, dewatering, and disposal projects. Oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, and directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport, disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Conduct onsite tailgate safety meetings
- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Monitor onsite and offsite conditions
- Ensure the stormwater BMPs are in place and functioning
- Attend preconstruction and progress meetings
- Perform site visits
- Oversee preconstruction condition surveys for loss prevention
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Receive, review, and approve submittals
- Maintain site shop drawing and as-built records
- Observe general quality of the work and reject defective work
- Oversee hazardous materials containment procedures
- Oversee compliance monitoring and air sampling during construction
- Conduct clearance sampling of hazardous materials
- Oversee inspection and testing requirements including grading, paving, and utility reconstruction
- Oversee site restoration
- Monitor construction progress schedules
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion.
- Conduct final inspections with owner and contractor.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification

- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with state agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has abundant experience with operation and maintenance of construction dewatering systems. When necessary, Fishbeck obtains the necessary permits for dewatering and designs, supplies, installs, and operates dewatering water treatment facilities.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

3.4 Site Closure:

Fishbeck has been responsible for hundreds of site closures achieved via excavation, dewatering, and disposal throughout the history of the firm. We have abundant experience with site closure and no further action procedures under Parts 201 and 213 of NREPA, 1994 PA 451, as amended. We have completed many approved site closure plans that have involved abatement of imminent risks, construction of mitigation systems, and presumptive remedies, implementation of institutional controls, and long-term performance monitoring. Following the approval of site closure or no further action status for a site, all remnants of monitoring systems and observation wells are removed and properly abandoned.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by EGLE and have obtained Storm Water Management Operator certification from EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review
- SESC inspection/enforcement

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Kerri Miller, PE, LEED AP Job Title: Senior Vice President/Principal
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Mike Ranck, PG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: Aaron Bigler Job Title: Environmental Scientist
Labor Classification: P3 College Degree(s): BS in Environmental Science and Planning and Minor in Geographic Information Science, University of Michigan-Flint
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 17

Name: Zachary Curry Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology, Grand Valley State University; Precambrian Research Field Camp, University of Minnesota-Duluth
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 18

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 19

Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 20

Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 21

Name: Brad Peuler, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 22

Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 23

Name: Therese Searles Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology and Environmental Studies, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☒Yes ☐No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Many circumstances arise during the performance of projects that require the assistance of various experts and specialists. Fishbeck's core environmental/remediation staff is fortunate to be supported by many other in-house staff in the following areas of expertise that many to called upon to support excavation, dewatering, and/or disposal projects:

- Structural engineering
- Electrical engineering
- Civil engineering
- Mechanical engineering
- Regulatory compliance
- Construction estimating
- Construction management

Our structural engineers are available on short notice to make evaluations of foundation safety and requirements for shoring. Our civil engineers are well-versed in removal and relocating (temporary or permanent) of utilities which are sometimes discovered during excavation. We can conduct workspace and perimeter ambient air monitoring during excavation projects to assure that nearby residential receptors were not being exposed to concentrations above

acceptable screening levels (SLs) and workers were donning appropriate PPE (i.e., respirators or supplied air) within the active work area (exclusion zone). We are experienced in utilizing a HAPSITE gas chromatograph/mass spectrometer and operator were used to analyze collected air samples and provide real-time monitoring data and establish work area protocols to respond to exceedances of SLs detected by the HAPSITE.

Fishbeck has retained a health and safety equipment vendor for ongoing preventive maintenance of our PIDs and confined space gas meters. Each PID detector and gas meter is inspected, cleaned, and repaired at least once per year. This minimizes the probability of onsite equipment failure.

All field notes undergo an independent review prior to release to the project manager. Items such as meter calibrations and completeness of sample documentation forms are routinely checked. This procedure is part of our internal corporate QA/QC program.

Lastly, Fishbeck has, and currently holds, other ISID contracts for environmental, architectural, and civil engineering projects. We are familiar with the contracting process and are excited by the prospect of continuing to provide environmental services to the MDTMB.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Excavation, Dewatering & Off-Site Disposal*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Excavation ☒ Dewatering ☒ On-Site Treatment of Water ☒ Backfilling w/ Asphalt Cover

☒ Backfilling w/ Concrete Cover ☒ Backfilling w/ Permeable Pavement Cover ☒ Applied Treatment Train

☒ Sheet Piling / Soil Retention ☒ Stabilization ☒ Storm Water Management

☒ Sediment Removal

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>20	>20	0
Construction Oversight	>20	>20	0
O & M	5	5	0
Closed	>20	>20	0
Used Treatment Train	5	5	0
2. Range of cost per project:			
Design Phase	$10k–$35k	$10k–$35k	0
Construction Phase	$10k–$1.5M	$10k–$1.5M	0
O & M Phase	$2k–$10k	$2k–$10k	0
Total Project Cost	$20k–$1.5M	$20k–$1.5M	0
3. Number of the above projects that were:			
Below Budget	5	5	0
On Budget	>20	>20	0
Over Budget*	1	1	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	10	10	0
Licensed Chemical Engineers	1	1	0
Geologists	8	8	0
Hydrogeologists	10	10	0
Licensed Surveyors	8	7	0
Licensed Electrical Engineers	2	1	0
Licensed Mechanical Engineers	8	5	0
Environmental Science	2	2	0
Biologists	2	2	0

*Provide explanation, including strategies implemented to fix the issue:

Item 3) Private client project: Source area was discovered to be more extensive than originally anticipated. Client agreed to increase excavation quantity as a result. Fishbeck forfeited its markup on landfill disposal, in an effort to maintain project budget.

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our

clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. It is common to increase in the quantity of soil excavated during excavation projects. These issues are the most significant factors impacting project budget and schedule. When projects do exceed originally approved budgets, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Demolition

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Former Sugar Loaf Resort
Key Personnels: Therese Searles
Project Address: 4500 S. Sugar Loaf Mountain Road
Project City/State/Zip: Cedar, Michigan 49621
Owner/Client Contact Name and Telephone #: Ross Satterwhite, SPV 45, LLC – 312.593.4880

Project 1 Description:
The former Sugar Loaf Resort Hotel project site included the former lodge itself, as well as several outbuildings and ski lift systems on multiple sides of the mountain. The project site included a former lodge that consists of two main parts. The north "original" hotel was a mix of two-story and three-story portions. A small courtyard, an outdoor pool, a sauna, and locker rooms were situated west of the north hotel and are part of the project site. The primary

demo area included miscellaneous sheds, landscaping structures, a pool equipment shed, etc. that are part of the project area. Additionally, there were four smaller, separate areas on the ski hill that include various sheds, ski lift systems, and other structures. The south hotel was constructed in the late 1970s or early 1980s and consists of portions that were three-story and four-story hotel rooms with a conference room on each floor. An indoor pool and spa area were situated at the east end of the south hotel.

The total of the two hotel sections encompassed approximately 124,000 sf. Portions of each hotel included a basement with some utility pipe chases beneath the floor. Demolition also included two tennis courts and a basketball court. Challenges from site conditions included the hotel building being immediately adjacent to a residential development and condominiums, parking areas, and greenspace utilized by the residents. Portions of the roadway utilized by the contractor are also routinely used by the residents. A portion of oversight services involved ensuring that demolition operations did not impact the area residents, and staging and demolition activities did not impact access to or operation of the adjacent airfield/airstrip.

Three USTs were discovered on various portions of the site during demolition activities that were appropriately managed, including removal, site assessment sampling, and backfilling.

Demolition Scope:

- Securing all permits and providing all notices as required including but not limited to building demolition permit, soil erosion and control permit, notice to the State of Michigan, and all associated fees.
- Construction, implementation, and removal upon project completion of soil erosion control measures including but not limited to construction of a temporary drainage basin, determination of soil type in the proposed drainage basin area, placement of silt fencing, straw bales, stone drives, and other measures as required.
- Asbestos abatement:
- Removal of vermiculite insulation in concrete block walls of the “original” hotel building to the extent feasible.
- Removal of all friable asbestos-containing materials and those that could become friable through the demolition activities.
- Removal of any other previously unidentified asbestos-containing materials as discovered during the demolition process.
- Universal waste removal, recycling, and disposal, as appropriate (bulbs, thermostats, e-wastes, etc.).
- Utility disconnects, cut, cap, photograph and mark disconnect location.
- Site security (fencing).
- Building/structure demolition and removal, including removal of all foundations, basement slabs and walls, utility lines, pavements, pools, and other manmade structures.
- Because of the residual vermiculite insulation in the “original” hotel building after abatement, all demolition activities in this area must be conducted using “wet methods” and all debris must be disposed as “asbestos contaminated debris.”
- Traditional demolition methods may be used to demolish remaining portions of the project site if no asbestos-containing materials are present in the debris.
- Removal and disposal of exterior miscellaneous debris and garbage within the project area. Removal of any trees, shrubs, and landscaping that inhibits safety or access of the project. Removal of signs, lights, benches, sheds, gazebo, retaining walls, fences, walkways, and other site improvements.
- Abandonment of any septic system, sanitary lift station(s), and other features related to utilities.
- Placement of clean sand backfill, compaction, with final covering of four inches of topsoil.

Demolition oversight services included coordinating bidding activities, working with ownership on communications plan, retain surveying services, reviewing submitted contractor documentation, coordinating with utility companies, providing daily oversight during asbestos removal and demolition activities, reviewing air monitoring data, and reviewing pay requests.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition

Project 2 Reference Information:

Project Name: Old Three Rivers Hospital
Key Personnels: Therese Searles, Aaron Bigler
Project Address: 214 Spring Street
Project City/State/Zip: Three Rivers, Michigan 49093
Owner/Client Contact Name and Telephone #: Amy Roth, City of Three Rivers, Public Services Director – 269. 273.1845

Project 2 Description:

The property is known as the Old Three Rivers Hospital located at 214 Spring Street in Three Rivers. The four-story hospital was originally constructed in 1929, with several additions, and has been vacant since 1987. Over the years, the building had deteriorated leading to extensive damage including portions of the roof collapse, damaged and/or weakened structural features due to extensive water intrusion, and debris from damaged finish materials falling off the walls and ceilings.

The building was constructed into the side of a hill, and portions of the property are bordered by a public park which includes a pond adjacent to the structure. Site conditions created logistical challenges to the desired outcomes. Likewise, community values and public opinion also played a factor in project implementation. The Three Rivers Hospital held cultural significance to many members of the community. Fishbeck assisted the City of Three Rivers in developing communication plans for consistent messaging and managing community engagement efforts, such as providing keepsake bricks, that were well received by the community.

A hazardous materials building survey was completed by Envirologic (now Fishbeck) and BDN Industrial Hygiene Services (BDN) in 2006. In 2022, the City of Three Rivers (City) engaged an abatement and demolition contractor to complete the removal of all asbestos-containing materials (ACMs) and asbestos-contaminated debris, and then conduct the building/structure demolition and removal of foundations, walls, basement slabs, pavements, and other man-made structures. Fishbeck was contracted by the City to conduct oversight services related to the abatement and demolition project. Structural determinations regarding ability to safely complete the requested scope of work were established as contractor responsibilities. After submitting the 10-day notification to the State, asbestos abatement services were initiated in July 2022, and abatement services took approximately six weeks to completed. The demolition contractor then engaged a licensed professional engineer to conduct a structural review of the property, who determined that the building was structurally unsound and had the potential for significant dangerous outcome. As a result, the City building official issued a notarized affidavit ordering the demolition of the structure due to imminent danger of collapse and being structurally unsound.

When the demolition project moved into an ordered demolition, Fishbeck coordinated efforts between the project team to ensure that health and safety of workers, the environment, and surrounding community remained a priority. As of April 2023, the building has been safely demolished and site restoration activities are underway.

Multiple funding sources were leveraged to assist this project in moving forward. The City sought support from the St. Joseph County Brownfield Redevelopment Authority through its U.S. EPA Brownfield Assessment Grant. These funds were utilized to conduct perimeter air monitoring during the demolition activities, to provide data to assess deployment of engineering controls and protect the health and safety of surrounding residents. A portion of these funds were also utilized to appropriately manage a discovered heating oil tank.

Fishbeck conducted project oversight services, on behalf of the owner, throughout each stage of the project. Oversight services consisted of managing documentation, conducting site visits and performing visual observations, ensuring scope of services provided was consistent with specification requirements, coordinating with EGLE representatives, etc.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition

Project 3 Reference Information:

Project Name: Metea Court Senior Apartments
Key Personnels: Therese Searles
Project Address: 705 Rynearson Street
Project City/State/Zip: Buchanan, Michigan 49107
Owner/Client Contact Name and Telephone #: Matt Hollander, Hollander Development Corporation – 269.338.4677

Project 3 Description:

Hollander Development Corporation, a leader in the development of affordable, high quality apartment communities for families and seniors throughout Michigan, made development-wide renovations to the Metea Court Senior Apartments located in Buchanan, Michigan. The Metea Court apartments are a low-income senior living housing development built in two separate phases. The first phase of buildings (Phase I) was constructed in 1972 and included 15 buildings with 76 apartment units and one community building. The Phase II buildings were constructed in 1975 and include four buildings with 24 apartment units. To support the development of the Metea Court Senior Apartments, Hollander Development received outside funding including a $3.4 million Low Income Housing Tax Credit investment from Cinnaire, a $1.8 million Fannie Mae immediate permanent loan, and a $1.5 million construction loan.

Before renovations began, it was necessary to identify and mitigate hazards associated with tenants' potential exposure to asbestos, radon, and lead. Portions of the Phase I buildings had previously been evaluated for these materials. Envirologic (now Fishbeck) was therefore retained to assess the Phase II buildings, as well as the Phase I units that were not previously assessed. Additionally, at the start of the project, we coordinated with the renovation architects to develop renovation sequencing and to determine how potential radon, asbestos, and lead exposures would be eliminated. Our staff then coordinated with the client's general contractor and construction manager throughout the entire renovation process to ensure these plans were correctly implemented and the resulting renovated units were safe and in compliance.

We performed a radon survey of the previously un-assessed Phase II units. Test results indicated eight of the units contained radon at levels above the U.S. EPA's action level of 4 pCi/L. To reduce concentrations to nonhazardous levels, we recommended that radon mitigation systems be installed in all eight units. After these systems were installed, we inspected the systems and reaffirmed post-mitigation maintenance protocol.

We also completed an asbestos survey of the Phase I and Phase II buildings and oversaw the subsequent asbestos abatement activities. Only asbestos-containing materials (ACMs) with the potential to be impacted by the planned renovation activities were abated; an operation and maintenance plan was created to manage ACMs left in place. Following the surveys, our staff reviewed the planned renovation tasks and determined the appropriate level of training and required work practices.

A combined lead inspection and risk assessment of the Phase II buildings was also conducted; however, no lead-based paint or lead-based paint hazards (paint, dust, soil) were identified. Asbestos, lead, and radon closeout documentation in compliance with MSHDA requirements was prepared and submitted.

The following remedial technologies were utilized in this project:

- Demolition

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has extensive experience successfully teaming with clients to completing demolition projects under state and federal regulations. Through historic document review, investigation, strategic planning, and design; Fishbeck's attention to detail reduces risk to meet our clients decommissioning and demolition project goals. Our project teams

include experienced environmental, structural, and mechanical engineers; hazardous materials managers; ecologists; and industrial hygienists who keep abreast of new technologies and methods through the attendance of conferences, training, seminars, and reading of relevant professional journals. The depth and experience of our in-house staff allows us to design all required aspects of demolition projects including:

- Prepare site use history documents to identify potential environmental concerns.
- Prepare regulated material sample plans.
- Conduct regulated material sampling and analysis.
- Evaluate hazardous materials survey results and data to develop abatement strategies and methods.
- Design abatement programs and procedures including containment, air monitoring, and clearance sampling.
- Conduct building surveys and structural evaluations.
- Prepare schematic, preliminary, and final demolition plans and procedures.
- Design systems for structural support/protection of neighboring structures.
- Survey existing site features and property boundaries for restoration after construction.
- Prepare grading, restoration, and paving plans.
- Design replacement pavement sections appropriate for intended site use.
- Plan for termination/repair/replacement of site utilities.
- Perform waste characterization of building materials for disposal.
- Prepare soil erosion and sedimentation control programs.
- Produce design documents including detailed plans and specifications.
- Prepare and disseminate bidding documents.
- Conduct pre-bidding meetings.
- Respond to questions and issue addendums and bulletins.
- Assist with contractor selection and procurement.
- Act as the site representative for demolition oversight and monitoring.
- Verify contractor health and safety training and medical monitoring programs.

Fishbeck has worked successfully with the Michigan Department of Technology, Management and Budget (MDTMB) on numerous State of Michigan projects under various types of contracts to provide demolition design and oversight services. Fishbeck understands the MDTMB contracting mechanisms, budget, and payment procedures. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division. Additionally, Fishbeck is well-versed in completing construction and bidding documents using the current edition of MDTMB MICHSPEC, DCSPEC, or 50KSPEC requirements.

For more detailed information, see resumes in the appendix.

3.2 Construction Oversight:

Fishbeck maintains trained and experienced staff who routinely provide all aspects of oversight services on decommissioning and demolition projects. Oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, and directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport and disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Conduct onsite tailgate safety meetings
- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Monitor onsite and offsite conditions
- Ensure the stormwater BMPs are in place and functioning
- Attend preconstruction and progress meetings
- Perform site visits

- Oversee preconstruction condition surveys for loss prevention
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Receive, review, and approve submittals
- Maintain site shop drawing and as-built records
- Observe general quality of the work and reject defective work
- Oversee hazardous materials containment procedures
- Oversee compliance monitoring and air sampling during construction
- Conduct clearance sampling of hazardous materials
- Oversee inspection and testing requirements including grading, paving, and utility reconstruction
- Oversee site restoration
- Monitor construction progress schedules
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion.
- Conduct final inspections with owner and contractor.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- Asbestos Contractor Supervisor qualified
- NIOSH 582 Certification (Asbestos)
- Lead Inspector
- Lead – Risk Assessor
- NRPP Residential Measurement Provider for Radon
- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M: This topic is generally not applicable for this technology.

3.4 Site Closure: This topic is generally not applicable for this technology.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by the EGLE and have obtained Storm Water Management Operator certification from the EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review

- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Aaron Bigler Job Title: Environmental Scientist
Labor Classification: P3 College Degree(s): BS in Environmental Science and Planning and Minor in Geographic Information Science, University of Michigan-Flint
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Therese Searles Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology and Environmental Studies, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☒Yes ☐No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Many circumstances arise during the performance of demolition projects that require the assistance of various experts and specialists. Fishbeck's core environmental/remediation staff is fortunate to be supported by many other in-house staff in the following areas of expertise:

- Industrial hygiene
- Air quality
- Structural engineering
- Electrical engineering
- Civil engineering
- Mechanical engineering
- Regulatory compliance
- Construction estimating
- Construction management
- Information technology
- Building information modeling (BIM)
- Graphical information systems

Our structural engineers are available on short notice to make evaluations of foundation safety and requirements for shoring. Our civil engineers are well-versed in removal and relocating (temporary or permanent) of utilities which are sometimes discovered during demolition. We can conduct workspace and perimeter ambient air monitoring during excavation projects to assure that nearby residential receptors were not being exposed to concentrations above acceptable screening levels (SLs) and workers were donning appropriate PPE (i.e., respirators or supplied air) within the active work area (exclusion zone).

Fishbeck has retained a health and safety equipment vendor for ongoing preventive maintenance of our PIDs and confined space gas meters. Each PID detector and gas meter is inspected, cleaned, and repaired at least once per year. This minimizes the probability of onsite equipment failure.

All field notes undergo an independent review prior to release to the project manager. Items such as meter calibrations and completeness of sample documentation forms are routinely checked. This procedure is part of our internal corporate QA/QC program.

Lastly, Fishbeck has, and currently holds, other ISID contracts for environmental, architectural, and civil engineering projects. We are familiar with the contracting process and are excited by the prospect of continuing to provide environmental services to the MDTMB.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Demolition*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Pneumatic / Hydraulic Breakers ☒ Mechanical Demolition and Dismantling

☐ Pressure / Mechanical / Chemical Bursting ☒ Explosives ☒ Ball and Crane ☒ Recycling

☒ Excavation / Dewatering / Sheet Piling ☒ Backfilling with Asphalt / Concrete Cover

☒ Asbestos / Lead Abatement Experience

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>25	>25	0
Construction Oversight	>25	>25	0
O & M	0	0	0
Closed	>25	15	0
Used Treatment Train	0	0	0
2. Range of cost per project:			
Design Phase	$2k-$100k	$2k-$100k	0
Construction Phase	$10k-$6M	$10k-$6M	0
O & M Phase	0	0	0
Total Project Cost	$12k-$6.1M	$12k-$6.1M	0
3. Number of the above projects that were:			
Below Budget	~10	~10	0
On Budget	>20	>20	0
Over Budget*	2	2	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	10	10	0
Licensed Chemical Engineers	2	2	0
Geologists	4	4	0
Hydrogeologists	5	5	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	4	3	0
Licensed Mechanical Engineers	4	2	0
Environmental Science	4	4	0
Biologists	2	2	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of projects Fishbeck has worked on over the past 10 years, it is difficult to provide exact numbers for the quantity of projects of each type. Also, in most cases, project budget overages resulted from changes in scope at the request of the client and encountering unforeseeable conditions. Typical changes include increasing the number of samples during the NESHAP investigation, encountering USTs, increasing material quantities, and discovering buried waste material. Fishbeck makes it a practice to identify and communicate changes to our clients as soon as possible so

strategies can be developed to minimize costs through development of innovative/alternative means and methods, or selective elimination of scope.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Migration Control Containment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: MAHLE Sanford Street Facility
Key Personnels: Bruce Gillett, CPG, Chad Weber, PE
Project Address: 2001 Sanford Street
Project City/State/Zip: Muskegon Heights, Michigan 49444
Owner/Client Contact Name and Telephone #: Michael Zack – 248.305.8200

Project 1 Description:
In 2019, Fishbeck was retained by MAHLE to perform troubleshooting and optimization of three aging air sparge/soil vapor extraction (AS/SVE) systems at the Sanford Street site for remediation of chlorinated volatile organic compounds (CVOCs). The systems had been plagued by maintenance issues. Fishbeck performed the

needed repairs and optimized the operating configuration resulting in increased uptime and remedial effectiveness. Since 2019, Fishbeck has performed the ongoing operation and maintenance (O&M), with all systems continuing to operate as designed.

From 1988 to present, a groundwater containment (i.e., pump and treat) system has been operating at the site to control migration of dissolved CVOC impacts in groundwater. Hydraulic control for the site is maintained by two pumping wells with one pumping well operating and the other serving as backup. The project includes routine maintenance and occasional rehabilitation of the two pumping wells which each operate at a rate of approximately 200 gallons per minute. The CVOCs are treated via air stripper and the system effluent is discharged to a nearby creek under a National Discharge Elimination System (NPDES) permit. During the growing season, the system effluent is also used for irrigation of a 6-acre vacant portion of the site. Since 2019, Fishbeck has been performing O&M for the groundwater containment system and air stripper as well as monitoring the system's effectiveness.

Fishbeck has also been performing ongoing groundwater monitoring and reporting in accordance with the site's *Post Closure Plan* (PCP). All activities are being performance in accordance with Part 111, Michigan's Natural Resources and Environmental Protection Act (NREPA); the environmental protection standards of Part 201, as currently adopted by Part 111, where not less stringent than the Resource Conservations and Recovery Act (RCRA), RCRA, and other pertinent state and federal laws and their applicable regulations. An evaluation of potential vapor intrusion is also currently in progress.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: Pools Prairie Superfund Site Manufacturing Plant Area
Key Personnels: Ali Dahlbacka, Michael Apgar
Project Address: 3551 Doniphan Drive
Project City/State/Zip: Neosho, Missouri 64850
Owner/Client Contact Name and Telephone #: Edgard Bertaut – 412.395.3052

Project 2 Description:
Fishbeck was selected by the performing respondents established in an Administrative Settlement Agreement and Order on Consent (Settlement Agreement) to design and implement a removal action strategy for a former rocket engine development and testing site. The contaminants of concern included chlorinated volatile organic compounds (CVOCs) (primarily trichloroethene [TCE]) and petroleum hydrocarbons [PHCs]) in seven discrete areas of the site. The prescribed action was to excavate the most heavily impacted soil, treat residual CVOCs using soil vapor extraction (SVE), and biologically degrade residual petroleum hydrocarbons with a bioventing system.

Fishbeck's design included details for excavation and onsite treatment of nearly 6,000 cubic yards of soil, installation of 10 horizontal extraction trenches and 16 vertical SVE wells, and installation of a low-volume unsaturated zone bioventing (i.e., air sparging) system. With regulatory approval, Fishbeck began implementing the removal action plan using a combination of in-house staff and select contractors. Site preparation activities included the abatement and demolition of existing site structures, repair of an existing landfarming facility, dredging of sediments from an existing stormwater collection basin, construction of a stormwater collection and treatment system, and the development of a haul route for transporting soils between the MPA and the landfarming area. The stormwater treatment system consisted of a dual duplex particulate filtration system and granular activated carbon.

TCE concentrations in excavated soils as high as 3,700,000 micrograms per kilogram (µg/kg) were effectively reduced to the established treatment standard of 1,000 µg/kg; TCE concentrations in most treated soil samples were less than 300 µg/kg. The SVE systems included an innovative use of deep trenching technology to provide a

larger surface area for extraction in the clay-rich upper residuum (0 to 30 feet below ground surface) and increase the likelihood of intersecting permeable layers, thereby enhancing airflow through impacted soils. Vertical SVE wells were used in the deeper, more conductive soil zone. In March 2022, the USEPA provided concurrence that the SVE systems have removed the mass of CVOCs in source area soils at the MPA to the extent practicable, and as such, have met or exceeded the requirements for the removal set forth in the Settlement Agreement. The bioventing system designed and constructed to address residual PHCs in shallow vadose zone soils included the installation of 16 air injection wells, an air compressor skid, and a flow control manifold. Atmospheric air was injected into the soil at a rate that exceeded the stoichiometrically derived oxygen demand based on typical degradation rates. The manifold system consisted of a timer, flow meters, manual flow control valves, and solenoid valves configured to deliver the predetermined amount of air to each well. Throughout operation of the bioventing system, oxygen and carbon dioxide concentration data obtained from the bioventing wells during periodic, 48-hour biodegradation assessments were used to calculate oxygen utilization and carbon dioxide production rates. In March 2022, the USEPA provided concurrence that the objective of remediating vadose zone soils impacted with PHCs to the extent practicable has been achieved; this determination is based on diminishing biological activity and extended system operation.

In 2022, all SVE and bioventing infrastructure at the MPA were decommissioned. A Decommissioning Summary Report describing those activities was prepared by Fishbeck and submitted to USEPA for review. Fishbeck is currently preparing a Final Removal Action Report describing all removal action activities conducted at the MPA.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Migration Control, Fluid Removal, and Containment
- Landfills
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

Project 3 Reference Information:

Project Name: Former Teledyne Ryan Electronics Site
Key Personnels: Peter Lepczyk, CPG, Chad Weber, PE, Brad Peuler, CPG
Project Address: 8650 Balboa Avenue
Project City/State/Zip: San Diego, California 92123
Owner/Client Contact Name and Telephone #: Mark Thomasen – 302.368.7350

Project 3 Description:

Fishbeck conducted a supplemental remedial investigation as part of the Corrective Measures Study (CMS) for groundwater at a site impacted with chlorinated volatile organic compounds CVOCs (primarily 1,1-DCE). The former Teledyne Ryan Electronics facility manufactured radar and navigation systems for the U.S. Department of Defense. Operations at the facility ceased in 1994, portions of the facility buildings were subsequently demolished, the soil was remediated through SVE, and the property redeveloped.

Investigative activities focused on the reinterpretation and verification of a revised conceptual site model that better explained the distribution of CVOCs in the subsurface and the potential of a monitored natural attenuation remedy. Through the installation of strategically located monitoring wells using rotosonic drilling methods; monitoring of VOCs, geochemical parameters, compound specific isotopes (CSIA), and magnetic susceptibility; Fishbeck confirmed the unique hydrogeological characteristics of a leaky confined aquifer with multiple groundwater flow directions and demonstrate that degradation is occurring from an abiotic mechanism. Another distinctive aspect of the investigation was that certain drilling locations occurred in an area of sensitive habitat and required the submission of a biological monitoring plan and approval by the U.S. Fish and Wildlife.

Following completion of the field activities, estimates of the attenuation and degradation rates were developed using linear regression analysis, BioPIC, and Biochlor. The site-specific degradation rates were then utilized in a groundwater fate and transport model developed inside of MODFLOW and RT3D to assess whether CVOCs will naturally attenuate before migrating off the property at concentrations greater than maximum contaminant levels (MCLs). A draft CMS was provided to the Department of Toxic Substances Control for review which recommended an MNA alternative for the site.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Biological Treatment
- Alternative Technologies/Post Remediation Strategies

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has successfully completing remediation projects under state and federal programs focused on migration control, fluid removal, and containment for 42 years. The overall concept of this group of technologies is foundational to the field of remediation. Beginning in the 1980s, groundwater remediation was primarily focused on pump and treat. Subsequently our remedial design experience in this group of technologies dates back over four decades. Although, certain techniques may be antiquated, they are still considered and implemented when appropriate and cost-effective. However, there is also room for innovation in the concept of migration control, which we routinely practice during the development of these remedies.

Related to this remedial design group, Fishbeck has experience with slurry walls, purge well barriers, sheet piling, groundwater pump and treat, dual and multi-phase extraction, SVE, impermeable capping, and MNA.

Our project teams include experienced environmental chemists, engineers, biologists, ecologists, geologists, and hydrogeologists. Paramount to designing many of these remedies is possessing a comprehensive understanding of the hydrogeological characteristics (i.e. hydraulic conductivity, effective porosity, hydraulic gradients, aquifer geometry, etc.).

A breakdown of our experience and typical services on remedial design includes:

Design and Construction/Demolition:

- Development of remedial strategies and design concepts
- Detailed design of systems and procedures
- Production of design documents
- Preparation and dissemination of bidding documents
- Development and execution of cost-effective design/build strategies
- Construction/demolition inspection, oversight, and management
- Compliance monitoring and air sampling during construction/demolition
- Preparation of construction/demolition cost estimates

Design, specification, construction, and O&M of migration control, fluid removal, and containment strategies:

Performance Assessments:

- System performance evaluations
- Life cycle analysis
- Program enhancement analysis

Fishbeck will confirm design and construction efforts comply with state agency requirements as defined by the MDTMB Design and Construction Division. Fishbeck is well-versed in providing services to MDTMB and the client agencies

typically assigned to consultants for execution. As it relates to remedial design, Fishbeck has completed numerous feasibility studies under Phase 100 Environmental Investigation/Study services and routinely prepares reports in accordance with agency requirements.

Upon completion of the feasibility study and remedy selection, our team creates conceptual system designs, drawings, specifications, cost estimates, and other documentation as required under Phase 300 Schematic Design. When approved, the remedial design typically progresses toward Phase 400 Design Development where the design is further refined and draft drawings, specifications, budget, and scope are approximated. Fishbeck is also well-versed in completing Phase 500 Construction and Bidding Documents and the current edition of MDTMB MICHSPEC, DCSPEC, or 50KSPEC requirements.

For more detailed information, see resumes in the appendix.

3.2 Construction Oversight:

Fishbeck staff routinely provide construction oversight on our in-situ physical/biological treatment projects. We work with drilling contractors to direct and oversee the installation of injection/recirculation wells, development of wells, injection of amendments during our direct inject designs, etc. On many of our full-scale permanent injection well systems, we provide the construction services and equipment for the actual injection of amendments (e.g., pumps, manifolds, pressure gauges, flow meters, etc.). In general, our direct injection projects are designed in house; however, the actual field implementation is completed by a drilling contractor under the direct supervision of a field engineer.

Additional oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport and disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer’s set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor’s hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor’s pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will

confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has decades of experience preparing operation and maintenance (O&M) manuals for remediation systems and subsequent O&M activities. Within this MDTMB contract, it is handled under Phase 900 Operation and Maintenance Services – Remediation Facility.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in the referenced projects. For detailed information, please refer to project summaries above and resumes in the appendix.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures, multiple sites have relied upon migration control, fluid removal, and containment treatments. We have abundant experience with Part 213 site closure requirements, as defined under Section 21312a, Part 213, of NREPA, 1994 PA 451, as amended. Fishbeck has also been responsible for achieving site closures and no further actions for Part 201 sites, as defined under Section 20114d, Part 201, Environmental Remediation, of NREPA, 1994 PA 451, as amended. We have completed several approved site closure plans that have involved abatement of imminent risks followed by long-term performance monitoring.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by the EGLE and have obtained Storm Water Management Operator certification from the EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review
- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Mike Ranck, PG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16

Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 17

Name: Brad Peuler, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 18

Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☒Yes ☐No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the

environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include:

- Each summer, one of our hydrogeologists teaches single well hydraulic testing (i.e. slug testing) at the Western Michigan University Hydrogeology Field Camp.
- At a confidential project site, another one of our hydrogeologists designed a dual density groundwater flow and transport model to demonstrate that impacted groundwater would enter nearby surface water at a reduced rate due to the density difference between the impacted groundwater and the surrounding groundwater.
- At the Former Teledyne Ryan Electronics site, located in San Diego, CA, we refined and then validated the CSM through the collection of strategic hydrogeologic data that demonstrates a leaky confined aquifer with multiple groundwater flow directions and then successfully investigated the abiotic pathway through the analysis of magnetitic susceptibility and compound specific isotopes. This work was presented at the 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, Florida, May 19, 2015.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Migration Control, Fluid Removal & Containment*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Slurry Walls ☒ Purge Well Barriers ☒ Sheet Piling ☒ Groundwater Pump and Treat

☒ Dual and Multi-Phase Extraction SVE ☒ Impermeable Capping (e.g., Clay Caps)

☒ Natural Source Zone Depletion (NSZD) ☒ Monitored Natural Attenuation

☒ Sediment Caps ☒ Constructed Treatment Wetlands

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>25	>25	0
Construction Oversight	>25	>25	0
O & M	16	16	0
Closed	7	7	0
Used Treatment Train	>10	>10	0
2. Range of cost per project:			
Design Phase	$10k-$200k	$10k-$200k	0
Construction Phase	$80k-$4M	$80k-$4M	0
O & M Phase	$50k-$17M	$50k-$17M	0
Total Project Cost	$100k-$21M	$100k-$21M	0
3. Number of the above projects that were:			
Below Budget	0	0	0
On Budget	>25	>25	0
Over Budget*	0	0	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	5	5	0
Licensed Chemical Engineers	1	1	0
Geologists	5	5	0
Hydrogeologists	7	7	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	2	2	0
Biologists	3	3	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and

schedule. When projects do exceed their approved budget, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Landfills

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Harrison Landfill
Key Personnels: Fernanda Wilson PhD and Chad Weber PE
Project Address: Harrison, Hamilton County, Ohio
Project City/State/Zip: Harrison, Ohio 45030
Owner/Client Contact Name and Telephone #: Jim Leslie – 513.367.2111, ext. 4117

Project 1 Description:
The City of Harrison, Ohio retained Fishbeck to prepare an updated explosive gas monitoring plan (EGMP) consistent with Ohio Administrative Code (OAC) Rule 3745-27-12, promulgated July 1, 2021, for the former City of Harrison Municipal Landfill. The explosive gas monitoring network present at the site is configured to detect explosive gas concentrations using strategically placed probes. Each probe is located adjacent to historically placed waste material and between the waste and potential receptors. This network has been used historically to monitor

fugitive landfill gas emissions to ensure that gas concentrations do not exceed established regulatory limits (5% by volume or 100% of the lower explosive limit (LEL) at the facility boundary). The network is composed of both permanent and temporary probes. For the City of Harrison Municipal Landfill to continue using the temporary probes and comply with Rule 3745-27-12, Fishbeck prepared a "temporary probe alternative monitoring device demonstration" concomitant to the EGMP.

The EGMP submitted to Ohio EPA included:

- Description of the current explosive gas monitoring network present at the site.
- Property information and records review complying with OAC Rule 3745-27-12(F)(2)(b).
- Description of the geologic information of the site.
- Description of the landfill characteristics.
- A narrative of all explosive gas investigation performed at the site to date.
- Details of the explosive gas monitoring probes and alternative monitoring devices.
- Additional documentation such as letters sent to entities, notifications, boring logs, certification reports and most recent deed for each parcel of the site, and emergency contact list.
- Various map figures detailing boundaries, structures, properties, manmade explosive gas migration pathways, or any other potential sources of explosive gas within 200ft and 1000ft zone of the center of the landfill.
- The "Temporary Probe Alternative Monitoring Device Demonstration."

On April 27, 2022, Ohio EPA received the EGMP. The plan was submitted by Fishbeck, on behalf of the city of Harrison. On November 3, 2022, Ohio EPA received a final version of the plan, which was approved on December 16, 2022.

The following remedial technologies were utilized in this project:

- Landfills

Project 2 Reference Information:

Project Name: Ionia Landfill
Key Personnels: Cleveland Street
Project Address: Brad Peuler CPG
Project City/State/Zip: Ionia, Michigan 48846
Owner/Client Contact Name and Telephone #: City of Ionia, Precia Garland – 616.527.5776

Project 2 Description:

The Ionia City Landfill is a CERCLA (Superfund), multiple potentially responsible party site. It occupies 27 acres within the floodplain of the Grand River in Ionia, Michigan. The landfill operated from the mid-1930s until the late 1960s. Waste disposed of at the site included residential, commercial, and industrial, with drums containing both liquids and solids. Degradation of the drums allowed paint thinners and industrial solvents, including TCE, methylene chloride, styrene, toluene, and xylenes, to impact the soil and groundwater.

Following the removal of drums, surface filling and grading, and fence construction, a RI/FS was completed, and a point-source removal action was performed. A November 2001 consent decree specified two remedial actions for the groundwater, in which only chlorinated solvents and their daughter compounds (trichloroethene, cis-1,2-dichloroethene, and vinyl chloride) exceed their remedial goals.

- Groundwater from that portion of the plume with >500 µg/L total VOC would be recovered through three wells, passed through an air stripper, and discharged to the City of Ionia sanitary sewer.
- The remainder of the VOC plume would be evaluated for the presence and rate of monitored natural attenuation. Fishbeck value engineered a change to the existing remedial system in 2003. Through a POTW headworks analysis, system reconfiguration, and follow-up monitoring, the air stripper use prior to discharge of recovered groundwater to the sanitary system was eliminated, significantly reducing operation and maintenance costs.

Fishbeck negotiated with the USEPA and EGLE for an amendment to the Record of Decision. The agencies agreed to the following changes:

- Monitored natural attenuation for the entire Superfund site.
- Cessation of the pump and treat system based on the results of a USEPA-approved pilot test.
- Alternate concentration limits for the contaminated portion of the aquifer.

Groundwater monitoring is now conducted on a five-year frequency to assess the source area COC contribution to groundwater, monitor the effects of natural attenuation, and monitor MCL and GSI compliance. Quarterly site inspections are completed to evaluate condition of the site fencing and landfill cap and slope.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- Landfills
- Ex-Situ Physical Chemical Treatment

Project 3 Reference Information:

Project Name: Former Jackson Airport Sanitary Landfill
Key Personnels: David Warwick and Derrick Lingle CPG
Project Address: 3606 Wildwood Avenue
Project City/State/Zip: Jackson, MI 40202
Owner/Client Contact Name and Telephone #: Michael Overton – 517.788.4335

Project 3 Description:

The runway safety project at Jackson County – Reynolds Field for their main runway required 1,000 feet of safety area at each end. To meet these specifications the extended runway had to cross a portion of the former City of Jackson sanitary landfill located on the airport property. The materials in the landfill were unsuitable to support the overfill and resultant runway and taxiway pavements and had to be removed. Approximately 260,000 tons of sanitary and non-sanitary waste material were removed to make way for the new runway and its associated appurtenances. Supported by a USEPA Brownfield Assessment Grant from the Jackson County Brownfield Redevelopment Authority, Envirologic (now Fishbeck) defined the nature and extent of the waste by advancing 39 test pits through the former landfill. Samples of waste material were selectively obtained from nine test pits. Analyses of the nine samples included a hazardous waste characterization (TCLP metals, VOCs, SVOCs, RCI, herbicides, and pesticides). The waste was composed of household garbage, soil (used as daily cover), glass, construction debris, appliances containing asbestos, miscellaneous containers, and drums. Through this evaluation it was determined that approximately 300,000 cubic yards of material needed to be removed.

Fishbeck developed the bid specifications for the removal of the waste materials and assisted Jackson County with the selection of the contractor. Fishbeck, on behalf of the County, applied for and received a $1 million State of Michigan Brownfield loan to help off-set the costs of removal.

Fishbeck oversaw site operations specific to the transportation and disposal of waste material from the landfill, treatment, and disposal of groundwater removed from the excavation, identification, and segregation of suspect hazardous waste. Fishbeck prepared the documentation (work plan and quarterly reports) needed to support the EGLE loan. Fishbeck also coordinated with other project partners who were overseeing the removal and loading of the waste as well as the construction of the new runway.

Fishbeck coordinated with the County and the contactor prior to and during actual waste removal. Fishbeck monitored the contractor's daily activities to ensure compliance with project specifications, including review of contractor submittals, prepared and maintained waste manifests, landfill tickets, calculated/tabulated volume and weight, total each day, and maintained running totals. Weekly project meetings were conducted with the contractor and the County to discuss the prior week's progress, quantity of waste and groundwater removed/disposed, and the coming week's schedule.

During removal of the waste material, suspected hazardous waste was identified and stockpiled for additional characterization. Samples of the suspect materials were collected and analyzed for hazardous waste characterization analyses (TCLP metals and organics, corrosively, ignitability). Results of the samples were communicated, and the disposal of the material was arranged (coordination with disposal location and contractor).

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Landfills

Project 4 Reference Information:

Project Name: Reynolds/RPC Red Bluff Landfill
Key Personnels: Mike Apgar
Project Address: 1000 Diamond Avenue
Project City/State/Zip: Red Bluff, California 96080
Owner/Client Contact Name and Telephone #: Reynolds Consumer Products/Sarah Adams – 530.528.3301

Project 4 Description:

Fishbeck has provided consulting and design services for the Reynolds' Red Bluff facility for nearly 20 years. This facility manufactures molded paper products for consumer use. The associated landfill is no longer operating; however, the landfill has historically received PCB and heavy metal containing wastes.

As an unlined landfill, the landfill leachate communicates directly with site groundwater. This issue is further complicated by the presence of an agricultural water supply dam adjacent to the site on the Sacramento River, an identified sensitive fish habitat. Fishbeck has been the engineer/geologist of record for over 10 years studying the impact of landfill leachate on groundwater and surface water quality. Fishbeck's work was instrumental in developing a clear understanding of the site's hydrogeologic dynamics which demonstrated that the leachate impact was minimal. This work also facilitated remediation of a portion of the landfill and sale of the property to the United States Bureau of Reclamation for redevelopment of their irrigation system and restoration of critical fish habitat.

Fishbeck's responsibilities include assistance in the management of the onsite landfill; compliance reporting; NPDES application; and assistance, design, implementation, and reporting for NPDES mandated studies, minor financial predictions, engineering, and design for the onsite wastewater treatment system, and management of the facilities participation in the California CV-SALTS program, a program intended to decrease the discharge of salts into the Sacramento River and the San Francisco Bay Estuary.

Fishbeck provides as-needed special project work for the landfill. These projects have included design and development of bid specifications for transferring waste from the sites settling basins to the landfill, preliminary and final cap design services; capacity assessment and waste management planning; testing for methane generation within and adjacent to the landfill; development of post-closure methane management plans; design, implementation, and reporting for a one-year temperature study of the Sacramento River adjacent to the site. Fishbeck has also provided specialized services including securing US Fish and Wildlife valley elderberry longhorn beetle (an identified threatened species) credits from a conservation bank to compensate for habitat loss and removal of rattlesnakes to allow for safe survey of waste deposition areas. Fishbeck's work has resulted in a reduction in the landfill footprint, improved stormwater management, and developed a coordinated cost-effective approach for the management of waste deposition.

Fishbeck's work on the landfill also includes routine reporting of groundwater/leachate sampling results and development of the State of California required Preliminary Closure and Post-Closure Maintenance Plan including annual financial assurance reporting.

The following remedial technologies were utilized in this project:

- Landfills
- Ex-Situ Physical Chemical Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has a long history of successfully completing landfill projects under state and federal programs. We take pride in investigating, designing, constructing, and operating cost-effective remedial solutions for our clients. Fishbeck also has a history of providing cost-effective, innovative cleanup technologies/strategies. Our landfill experience primarily includes the assessment/investigation of the environmental impact of existing, unlined landfills (dumps); designing solutions to mitigate the impact of leachate, landfill gas (LFG), contaminated surface soil, and fugitive dust; design final cover systems (synthetic and clay); and design of vapor intrusion mitigation systems (sub-slab venting or depressurization) to protect occupants on an adjacent to unlined landfills. Our project teams can be as diverse as necessary to address a wide range of typical issues. Team members can include experienced environmental chemists, engineers, biologists, ecologists, hygienists, and hydrogeologists with experience or education in landfill composition, waste decomposition, leachate/groundwater dynamics, methane generation and mitigation, and general site work. A brief breakdown of our experience and typical services includes:

Design and Construction/Demolition:

- Development of remedial strategies and design concepts.
- Detailed design of systems and procedures.
- Production of design documents.
- Preparation and dissemination of bidding documents.
- Development and execution of cost-effective strategies.
- Construction/demolition inspection, oversight, and management.
- Compliance monitoring and air sampling during construction/demolition.
- Preparation of construction/demolition cost estimates.

Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division. Fishbeck is well-versed in providing services to MDTMB and the client agencies typically assigned to consultants for execution. As it relates to remedial design, and as presented in Phase I of our proposal, Fishbeck has completed numerous feasibility studies under Phase 100 Environmental Investigation/Study services and routinely prepares reports in accordance with agency requirements.

Once a remedy has been selected, our team creates conceptual system designs, drawings, specifications, cost estimates, and other documentation as required under Phase 300 Schematic Design. When approved, the remedial design typically progresses toward Phase 400 Design Development where the design is further fleshed out and draft drawings, specifications, budget, and scope are approximated. Fishbeck is also well-versed in completing Phase 500 Construction and Bidding Documents and the current edition of MDTMB MICHSPEC, DCSPEC, or 50KSPEC requirements.
For more detailed information, see project examples and resumes.

3.2 Construction Oversight:

Fishbeck maintains dedicated staff who routinely provide construction oversight services for remediation projects. These trained and experienced individuals handle all aspects of construction oversight with projects involving general site work, demolition, drilling, piping, trenching, excavation, and treatment systems. To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking

- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Our staff of professionals have O&M experience in a variety of groundwater/leachate and LFG collection and treatment systems, as well as other types of remediation treatment systems. Fishbeck has abundant experience preparing operation and maintenance (O&M) manuals for remediation systems and subsequent O&M activities. Within this MDTMB contract, it is handled under Phase 900 Operation and Maintenance Services – Remediation Facility.

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in a few of the referenced projects. For detailed information, see resumes.

3.4 Site Closure:

Fishbeck has been responsible for numerous environmental site closures throughout the history of the firm. For landfill projects, we have helped our clients prepare preliminary closure and post closure plans, final cover/cap designs, and property redevelopment plans.

For detailed information, see project summaries above.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by the EGLE and have obtained Storm Water Management Operator certification from the EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review

- SESC inspection/enforcement

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2
Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3
Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include our 1996 Honorable Conceptor Award from the American Council of Engineering Companies/MI and Michigan Society of Professional Engineers. This was a landfill closure project at PCA, Inc. in Manistee, Michigan. The innovative closure plan used fly ash from a neighboring power facility to solidify the wastewater lagoon sludge, which was then used to establish slopes for the landfill cap. The project involved dredging sludge from the lagoon and mixing it with offsite ash to establish final closure grade of the landfill. When the closure was complete, approximately 500,000 cubic yards of ash had been mixed with 200,000 yards of sludge from the lagoon. The combination of ash and sludge produced approximately 400,000 cubic yards of in-place fill. This project had many significant environmental and economic benefits. It was one of the first efforts to use solidified material from a lagoon closure to close a licensed landfill.

More recently, one of our clients in California was faced with conducting a very expensive hydrogeological study (estimated at up to $500,000) to demonstrate their landfill leachate was not negatively impacting the adjacent river water quality. Fishbeck assessed the situation, developed a conceptual site model, and performed limited sampling onsite using existing monitoring wells. This information was presented in a report that successfully convinced the Central Valley Regional Water Quality Control Board to rescind their request for additional study at the site.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Landfills*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Caps (plus Enhancements) ☒ Leachate Control/O&M ☒ Methane Gas Control (On-Site and Off-Site)

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	5	5	0
Construction Oversight	4	4	0
O & M	>10	>10	0
Closed (i.e. post-closure monitoring only remains)	>10	>10	0
Used Treatment Train	1	1	0
2. Range of cost per project:			
Design Phase	$60k-$300k	$60k-$300k	0
Construction Phase	$200k-$2M	$200k-$2M	0
O & M Phase	$100k-$1M	$100k-$1M	0
Total Project Cost	$300k-$3M	$300k-$3M	0
3. Number of the above projects that were:			
Below Budget	2	2	0
On Budget	>10	>10	0
Over Budget*	-	-	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	1	1	0
Licensed Civil Engineers	5	5	0
Licensed Chemical Engineers	2	2	0
Geologists	2	2	0
Hydrogeologists	4	4	0
Licensed Surveyors	4	4	0
Licensed Electrical Engineers	2	2	0
Licensed Mechanical Engineers	2	2	0
Environmental Science	2	2	0
Biologists	1	1	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and schedule. When projects do exceed the originally approved budget, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Indoor Air/Vapor Intrusion

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: 615 Holdings
Key Personnels: Paul French, Therese Searles, Alisa Lindsay PE, and Zachary Curry
Project Address: 615 W. Kalamazoo Avenue
Project City/State/Zip: Kalamazoo, Michigan 49009
Owner/Client Contact Name and Telephone #: William Murphy, Partner, 615 Holdings, LLC – 269.342.9900 and Phil Reed, Partner, 615 Holdings, LLC – 269.216.9976

Project 1 Description:
The property was a former gasoline and automotive service in a historic district residential neighborhood bordering downtown Kalamazoo. The site sat vacant of over 10 years and had fallen into significant disrepair. Utilizing the Kalamazoo County Brownfield Redevelopment Authority's U.S. EPA Brownfield Assessment Grant funds, Envirologic

(now Fishbeck) completed Phase I and II Environmental Site Assessments, hazardous building materials survey, asbestos survey, baseline environmental assessment, and due care documentation for the site. Petroleum contamination was identified in portions of the property in excess of various residential cleanup criteria and volatilization to indoor air pathway screening levels.

As part of the developer's due care obligations, our team oversaw site response activities, including removal of a contaminated soil pile, and placement of clean soil cover on unpaved areas.

Our team helped the City of Kalamazoo Brownfield Redevelopment Authority secure a $372,000 EGLE Brownfield Redevelopment Grant to support various activities necessary to redevelop the property into a mixed-use development. The grant funds were used to complete asbestos abatement activities, demolition, removal of contaminated soil encountered during construction, vapor intrusion mitigation, and a final soil cover. We developed the demolition specifications and coordinated all aspects of the project bidding process. Demolition was completed in 2020. We also developed a work plan and design specification for the installation of a vapor mitigation system for the planned new construction of two buildings—both are three-story, mixed-use structures with nine apartments each. Construction of the vapor mitigation system and buildings were completed in 2021. The vapor mitigation system includes a spray-applied vapor barrier liner and passive sub-slab depressurization system with remote sampling ports to verify vapor mitigation system performance. A robust operation, monitoring, and maintenance plan was developed and gained EGLE approval.

This redevelopment project returned a blighted underutilized property to productive use. It leveraged approximately $3.6 million in private development investment and is anticipated to create 18 to 24 permanent jobs, along with 18 residential units.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Indoor Air/Vapor Intrusion

Project 2 Reference Information:

Project Name: Central Manufacturing Services Logistics, LLC/Clark Logic
Key Personnels: Paul French
Project Address: 555 E. Eliza Street
Project City/State/Zip: Schoolcraft, Michigan 49087
Owner/Client Contact Name and Telephone #: Jamie Clark, Clark Logic – 800.315.8143

Project 2 Description:

The property/building was previously operated as an industrial latex/rubber manufacturer (Arco Industries). Perchloroethylene, trichloroethylene, toluene, and other solvents were reportedly utilized in the manufacturing processes at the site. Historic manufacturing activities resulted in impacts to soil, soil gas and groundwater beneath the property. Manufacturing activities ceased in 1996. The property was subsequently utilized for limited commercial and warehousing purposes and the 102,000 square foot site building was in significant disrepair.

Envirologic (now Fishbeck) completed Phase I and II ESAs and a BEA utilizing the Kalamazoo County Brownfield Redevelopment Authority's (KCBRA's) U.S. EPA Grant funds. We focused on ensuring that contamination remaining beneath the building slab would not pose a risk to future building occupants. The investigation revealed that in order to address this risk, a sub-slab depressurization system sufficiently large enough to address the full 102,000-sf building would be needed. In 2014, our team assisted the developer (Clark Logic) and Kalamazoo County in securing a $200,000 EGLE Brownfield Grant and a $150,000 EGLE Brownfield Loan. We also helped the county negotiate an agreement with the developer to provide repayment guarantees to support various due care activities at the site including waste disposal, soil management and vapor mitigation activities, which were necessary for site redevelopment.

Our team designed and installed a sub-slab depressurization system in late 2017 that included 14 suction points, five blower units, multiple alarm systems, and other components including testing and sealing of floor cracks. An operation, monitoring, and maintenance plan was initiated following system startup; monitoring results indicate

that negative pressure field that sufficient to prevent the migration of contaminated sub-slab soil gas into the structure has been induced beneath the site building.

Our team, working with the KCBRA, successfully proposed, secured, and implemented an EGLE grant and loan to fund the design and installation of the mitigation system, manage contaminated soil disturbed during redevelopment, remove abandoned hazardous substances, and ultimately provide Clark Logic with documentation of compliance with their due care obligations. Our work also included preparation of a Brownfield plan, progress reports and work plans for EGLE approval, budget spreadsheets, etc. to aid in the County's administration of the grant and loan. This site was used by EGLE for training staff on to vapor intrusion issues. The facility is currently utilized for manufacturing, commercial and warehousing purposes.

The following remedial technologies were utilized in this project:

- Indoor Air/Vapor Intrusion

Project 3 Reference Information:

Project Name: KALSEE Credit Union
Key Personnels: Paul French and Kayla Rooney
Project Address: 5424 Gull Road
Project City/State/Zip: Kalamazoo, Michigan 49048
Owner/Client Contact Name and Telephone #: Matt Lahman – KALSEE Credit Union 269.382.7800

Project 3 Description:

The subject facility was developed as an automotive service and gasoline filling station in 1967. The facility was abandoned in 2015 with all waste automotive service fluids and Underground Storage Tank (UST) remaining in place. KALSEE Credit Union (KALSEE) acquired the property June 2020 with the intent to redevelop the site as a branch office location.

In 2014, our team assisted the developer (KALSEE) and Comstock Township in securing an EGLE Brownfield Redevelopment Grant to support various due care activities at the site including waste disposal, UST removals, asbestos abatement, building demolition, source (soil) removal, site investigations, and the installation and startup of a vapor intrusion mitigation system (VIMS), which were necessary for site redevelopment.

Results from site assessment activities indicated the presence of petroleum contaminants associated with former USTs as well as chlorinated contaminants associated with automotive service activities in soil, groundwater, and/or soil gas beneath the site at concentrations that were not protective of the drinking water, groundwater/surface water interface, direct contact, and volatilization to indoor criteria. Source removal activities were initiated following tank removal and building demolition to remove LNAPL saturated soils beneath source areas.

Our team designed a sub-slab depressurization system to prevent the potential for migration of contaminated soil gas into the planned branch office. An active VIMS, which included sub-barrier venting and pressure monitoring systems, a spray applied vapor intrusion barrier, a blower system, and a remote telemetry monitoring system to continuously monitor VIMS operation and sub-slab pressure was installed during building construction. The VIMS was activated in January 2023; monitoring results indicate the VIMS will maintain a negative sub-slab pressure field that is sufficient to prevent the migration of contaminated sub-slab soil gas into the structure.

Our work also included preparation of a Brownfield plan, progress reports and work plans for EGLE approval, budget spreadsheets, and oversite of all grant and loan activities. Following completion of site activities, our team provided KALSEE with due care compliance documentation.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Indoor Air/Vapor Intrusion

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Indoor air/vapor intrusion (VI) has become an increasingly relevant risk mitigation and remedial design consideration as the science of our industry continues to advance. Fishbeck has an advantage over many firms in that our industrial hygiene department has been involved with indoor air evaluation projects for decades. Airborne contaminants are generated from a variety of sources such as cleaning agents, VOCs from new building materials, vapor intrusion from outdoor and sub-slab sources, and biological agents from various sources. Strategic sampling identifies problems, which helps to develop an action plan and create an effective O&M program.

Fishbeck routinely evaluates the soils and groundwater beneath site buildings to assess potential sources of vapor phase contamination and potential subsequent risk to indoor air pathway through vapor intrusion. We design appropriate sampling strategies in accordance with the EGLE "Guidance Document for the Vapor Intrusion Pathway May 2013 Remediation and Redevelopment Division." Our generalized approach involves developing a conceptual site model (CSM); evaluating the volatilization to indoor air pathway (VIAP); designing and implementing an investigation which may include soil, groundwater, soil gas, sub-slab, and indoor air sampling; interpreting and evaluating the findings; and making recommendations towards potential source-area remediation, VIAP risk mitigation, engineering controls, and/or institutional controls.

Fishbeck has designed, implemented, and maintained numerous vapor barrier installations, SVE systems, and passive and active sub-slab depressurization (SSD) systems. Our general approach to SVE and SSD systems for vapor mitigation are to design a system that is tailored to the building slab and foundation configuration (both for new and existing buildings), floor slab subbase material type, type and concentration of volatile constituent, and if the constituents of concern are detected in the occupied air space. The design goals are to 1) provide a preferred pathway for vapor migration from the sub-slab to the outside environment, 2) reduce sub-slab vapor pressure relative to the indoor air pressure, and 3) seal pathways to the extent practical to prevent vapors from entering the building (i.e. conduits, utility backfill, floor cracks, control joints, and foundation and wall penetrations). Our designs include system performance means and metrics, including sample ports for the distribution piping, vapor monitoring pins, and pressure gauges and flow meters. When necessary and depending on the vapor mitigation system design and potential elevated risk from the sub-slab vapors, addition features including blower monitoring and alarming devices, automated telemetry, interior vapor sensors, and supplemental exhaust control systems are added to the system design.

3.2 Construction Oversight:

Fishbeck has provided construction oversight on numerous VI projects. Because our services are considered specialized and critical for many construction projects, Fishbeck typically provides construction oversight, inspection, start-up testing, performance monitoring, and documentation of VI systems we have designed. Depending on the client's requirements, we have provided anywhere from the installation of vapor mitigation systems with specialized subcontractors, full-time oversight during liner installation and SSD system contruction, to periodic inspections to document installation of piping or specialized sealing and joining techniques. To ensure the quality and consistency of the installation, the staff responsible for design of the VI system elements are frequently assigned construction oversight duties. Also, Fishbeck's experience with the oversight of spray applied liner systems (our preferred method of liner installation), including staff who are manufacturer-qualified liner system inspection, has proven invaluable in ensuring the quality and integrity of the systems we design.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- Certified Vapor Barrier Inspector
- Certified Gas Vapor Barrier Inspector

Fishbeck maintains dedicated staff who routinely provide construction oversight services for remediation projects. These trained and experienced individuals handle all aspects of construction oversight with projects involving general site work, demolition, drilling, piping, trenching, excavation, and treatment systems. To ensure construction QA/QC is

established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Our staff of professionals has extensive O&M experience in a variety of indoor air/vapor intrusion remedial designs including both SVE and SSD systems with ex-situ treatment through granular activated carbon (GAC) or catalytic oxidation, when required. Typical O&M activities include monitoring flow, pressure, vapor sampling, blower performance, providing routine, and non-routine maintenance on equipment, sampling indoor air, and sub-slab monitoring points; checking the function of alarms; balancing system flow and vapor extraction points; and managing the exchange of filter media if used.

Ongoing O&M activities are also highlighted in a few of the projects included in this Part II of the proposal. For additional detailed information, see project summaries and personnel resumes.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm, including several which have had to address the VIAP. This has been accomplished through various methods, including removal of source material, mitigation of vapors through the installation of vapor barriers or SSD systems, and preparing institutional controls that specify future construction activities must evaluate this pathway and ensure that engineering controls are in place. We have abundant experience with site closure requirements, as defined under Section 21312a, Part 213 Leaking Underground Storage Tanks, of NREPA, 1994 PA 451, as amended. Fishbeck has also been responsible for achieving site closures and no further actions for Part 201 sites, as defined under Section 20114d, Part 201 Environmental Remediation, of NREPA, 1994 PA 451, as amended. We have completed several approved site closure plans that have involved abatement of imminent risks followed by VIAP mitigation and long-term performance monitoring.

For detailed information, see project summaries.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites; however, this is generally not applicable to this technology.

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Mike Ranck, PG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Aaron Bigler Job Title: Environmental Scientist
Labor Classification: P3 College Degree(s): BS in Environmental Science and Planning and Minor in Geographic Information Science, University of Michigan-Flint
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: Zachary Curry Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology, Grand Valley State University; Precambrian Research Field Camp, University of Minnesota-Duluth
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 17

Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 18

Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 19

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck has numerous special factors regarding our indoor air/vapor intrusion work, including, but not limited to:

- Fishbeck has membership in the Association of Vapor Intrusion Professionals and a member on the Michigan Petroleum Association's Environmental Issues Committee.
- Fishbeck assisted with the development of Orion Township's and the City of Auburn Hills's vapor mitigation policies to support brownfield development in these two communities.
- Panel participant on the 2017 Michigan Chemical Council discussion on Vapor Intrusion.
- Fishbeck has developed a library of standard operating procedures (SOPs) for the numerous pieces of equipment and sampling procedures used in the field investigations. SOPs have been specifically prepared for installation of vapor pins and vapor probes, collection of sub-slab vapor samples, and collection of short-term (7 minute) or long-term (8- to 12-hour) indoor air samples. These SOPs are prepared in accordance with EGLE guidance documents and other reputable sources such as ITRC, ASTM, and ANSI.
- Specialized in-house equipment, including, but not limited to, photoionization detectors (PIDs), multi-gas meters (ppm and ppb), methane detectors, helium detectors, helium shrouds, field gas chromatography, variable-pressure blowers, compressed gas, and high precision digital manometers.
- All PIDs are routinely calibrated each day of use and per manufacturer's recommendations. The calibration data are recorded on specific forms and included with the field notes.
- Fishbeck has retained a health and safety equipment vendor for ongoing preventive maintenance of our PIDs and confined space gas meters. Each PID detector and gas meter is inspected, cleaned, and repaired at least once per year. This minimizes the probability of onsite equipment failure
- Early work on landfill brownfield sites with significant methane concentrations present allowed Fishbeck to develop and hone our design capabilities. This design prowess was readily adaptable to other forms of VI projects.
- Support from our other departments, including industrial hygienists, civil engineers, electrical engineers, mechanical engineers, construction management, surveyors, and architects.
- We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Staff have continued their professional development through attendance at various EGLE, AIPG, and ITRC training sessions and conferences.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Indoor Air/Vapor Intrusion*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Indoor Air Sampling/Abatement ☒ Air Purifying Units (APUs) ☒ Vapor Pins/Gas Wells Installation

☒ Vapor Barrier Installation ☒ Soil Vapor Extraction (SVE) ☒ Monitoring Systems

☒ Passive/Active Sub-Slab Depressurization (SSD) ☒ Monitoring/Inspection of SSD Systems

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>100	>100	0
Construction Oversight	>50	>50	0
O & M	>50	>50	0
Closed (i.e. met due care obligations – non-liable party)	>20	>20	0
Used Treatment Train	5	5	0
2. Range of cost per project:			
Design Phase	$3k-$50k	$3k-$50k	0
Construction Phase	$10k-$200k	$10k-$200k	0
O & M Phase	$5k-$100k	$5k-$100k	0
Total Project Cost	$18k-$350k	$18k-$350k	0
3. Number of the above projects that were:			
Below Budget	>10	>10	0
On Budget	>100	>100	0
Over Budget*	>5	>5	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	5	5	0
Licensed Chemical Engineers	1	1	0
Geologists	5	5	0
Hydrogeologists	8	8	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	2	2	0
Biologists	3	3	0

*Provide explanation, including strategies implemented to fix the issue:

Item 4) Please note that our industrial hygiene group has been involved in multiple indoor air quality projects throughout the history of our firm, contributing in a significant number of projects completed over the past 10 years.

Also, due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of unknow conditions. These issues are the most significant factors impacting project budget and

schedule. When projects do exceed originally approved budgets, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

In-Situ Physical/Chemical Treatment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Military Equipment Manufacturing Facility Environmental Services
Key Personnels: Peter Lepczyk CPG, Chad Weber PE, and Brad Peuler CPG
Project Address: 76 South Getty Street
Project City/State/Zip: Muskegon, Michigan 49442
Owner/Client Contact Name and Telephone #: Mark Thomasen, REM, CHMM – 302.368.7350

Project 1 Description:
Fishbeck is implementing investigative and remedial activities at a legacy site in Michigan used for the manufacturing of military equipment. Fishbeck was retained by the performing defendants established under a Consent Decree (CD) to implement a complex Statement of Work to address volatile organic compounds (VOCs), chlorinated volatile organic compounds (CVOCs), light nonaqueous phase liquids (LNAPLs), metals, polychlorinated

biphenyls (PCBs), cyanide, and per- and polyfluoroalkyl substances (PFAS). Activities are being performed consistent with Part 111 of Michigan's Natural Resources and Environmental Protection Act (NREPA), which is patterned after the federal Resource Conservation and Recovery Act (RCRA) program.

The following tasks are outlined in the CD and noteworthy aspects of the project are described in detail below:

- Characterization of the hydrogeology, including hydrostratigraphy, groundwater velocities, position of groundwater divide, temporal variation, and groundwater/surface water interface (GSI).
- Determination of the spatial distribution of dissolved-phase impacts within the aquifer and the location of areas of elevated CVOC mass.
- Determination of the spatial distribution of soil impacts within the unsaturated zone.
- Designing, constructing, and operating a soil vapor extraction (SVE) system to reduce CVOCs in the unsaturated zone.
- Designing, constructing, and operating an enhanced reductive dechlorination (ERD) treatment system with the objective of rapidly reducing CVOC concentrations in the groundwater.
- Excavation of metals-impacted soil.
- Designing and constructing exposure barriers to prevent contact with VOC, cyanide, and PCB-impacted soil.
- Placement of restrictions and environmental license agreements to ensure future uses are protective of human health and the environment.
- Performance of a risk assessment.

Fishbeck utilized both conventional and high-resolution site characterization (HRSC) technologies to perform much of the hydrogeological and remedial investigative work. The HRSC included advancement of 110 membrane interface probe/hydraulic profiling tool (MiHPT) borings to characterize the spatial distribution of VOCs and hydrostratigraphy throughout the multiple areas of concern (AOCs). These data were used to develop conceptual site models (CSMs) for the AOCs. The approved CSM for the GSI pathway demonstrated that the current monitoring well network was inappropriate to assess concentrations of VOCs venting to the wetland. Fishbeck determined that CVOCs remaining within the lower portion of the aquifer were transported parallel beneath a creek/wetland system, instead of venting vertically to the wetland adjacent to where the groundwater migrates beneath the surface water feature. A new shallow monitoring well network is scheduled for installation in 2023.

Following HRSC, Fishbeck designed an ERD system in one of the AOCs established in the CD with the objective of rapidly reducing CVOC concentrations in groundwater. The ERD system was comprised of 40 permanent injection/extraction wells and select existing wells from a previous ERD effort positioned in three separate treatment areas; the HRSC work refined the ERD design that was conceptually included in the CD. The first emulsified vegetable oil (EVO) injection occurred in 2020. In total, approximately 13,000 gallons of EOS_{Pro} were distributed and over 4,000,000 gallons of groundwater were recirculated to distribute the EVO and BAC-9 (a proprietary bioaugmentation culture of dehalogenating organisms). Performance monitoring data collected to date indicate that ERD is effectively remediating CVOCs throughout the three treatment zones. A second EVO injection event will be performed in 2023.

Fishbeck designed and oversaw the construction of an SVE system consisting of 11 SVE wells, underground conveyance piping, a flow distribution manifold, an SVE blower, and a vapor treatment system. Extracted vapors were treated using three granulated activated carbon adsorbers plumbed in series. The system was constructed in November 2019, and full-time operation started on December 2, 2019. Fishbeck maintained and operated the SVE system for 2 years (until November 30, 2021), as specified in the CD. During that time, the system removed an estimated 734 pounds of CVOCs from the vadose zone. Though the SVE system operated for the specified duration, treatment may be resumed in the future. The persistence of relatively high VOC mass removal by the SVE system during its 2-year operating period is attributed to the presence of LNAPL within the SVE treatment area. An LNAPL investigation is currently underway (handled by others) to further characterize the nature and extent of the LNAPL and to inform the selection of a comprehensive LNAPL management approach. Additional operation of the SVE system will be considered in conjunction with the selected LNAPL remediation approach.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: MAHLE Industries, Inc. – Harvey Street Facility
Key Personnels: Bruce Gillett CPG, Mike Apgar, Bailey Hannah
Project Address: 2051 S. Harvey Street
Project City/State/Zip: Muskegon, Michigan 49444
Owner/Client Contact Name and Telephone #: Michael Zack, MAHLE Industries, Inc. – 248.305.8200

Project 2 Description:
This project included hexavalent chromium and TCE remediation in source area soils and groundwater. Site manufacturing included piston rings. Hexavalent chromium was released to the soil (14-foot-thick vadose zone) and groundwater (60-foot-thick aquifer) under a plating bath area that included 14 plating lines. The TCE was released in the same general area from multiple degreasing operations.

Fishbeck performed all investigative and feasibility studies remediation design, construction, and performance monitoring of the remedial activities, including development of all associated work plans and reporting.

TCE remediation was accomplished using an aggressive AS and SVE system; the extracted vapors were treated with GAC prior to discharge. After operation of the AS/SVE system for approximately four years, soil and groundwater sampling verification was performed, and all results indicated closure criteria were met.

The hexavalent chromium remediation was accomplished using in situ injection of calcium polysulfide to reduce the chromium to an immobile form. Hexavalent chromium concentrations in groundwater were reduced from over 500,000 µg/L to less than the drinking water criterion of 100 µg/L. Offsite migration of impacted groundwater was accomplished by the design, installation, and O&M of two groundwater extraction wells. The impacted groundwater was discharged to the sanitary system under permit from Muskegon County. The extraction wells are no longer operating as the concentrations have dropped below applicable criteria.

Although the injections also treated the source area soils, an impermeable polyurea liner and new concrete floor were installed in the source area to prevent infiltration and exposure to any potential remaining hexavalent chromium in the soil. Potential exposures to residual soil and groundwater contamination are prevented by a Restrictive Covenant for the site which prohibits groundwater use and disturbance of the impermeable liner/concrete over the source area soils. A No Further Action status for hexavalent chromium is being pursued and is anticipated in 2024. Delineation of the nature and extent of recently discovered PFAS compounds is ongoing.

The following remedial technologies were utilized in this project:
- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 3 Reference Information:

Project Name: Former Teledyne Howell Penncraft Facility
Key Personnels: Michael Apgar and Ali Dahlbacka
Project Address: 3333 West Grand River Avenue
Project City/State/Zip: Howell, Michigan 48855
Owner/Client Contact Name and Telephone #: Mark Thomasen, REM, CHMM – 302.368.7350

Project 3 Description:

Fishbeck is conducting interim response actions at this site with the objectives of 1) reducing the mass of dissolved chlorinated volatile organic compounds (CVOCs) in groundwater using enhanced reductive dechlorination (ERD) and 2) reducing residual CVOC concentrations present in vadose zone soils and perched water using a combination of excavation, ERD, and soil vapor extraction (SVE).

The last ERD injection event into the aquifer was performed in 2010. Based on performance monitoring results, aquifer remediation is essentially complete; nearly 99% of the trichloroethene (TCE) mass within the aquifer has been destroyed, and dehalogenation is proceeding to the generation of ethane and ethene. Source removal of shallow impacted soils (0 to 10 feet bgs) was performed in 2011. To address TCE impacts in the lower vadose zone (10 to 40 feet below ground surface [bgs]), Fishbeck designed and installed a 34-well SVE system. Fishbeck maintained and operated the system from 2010 to 2015. During that time, the SVE system removed an estimated 1,660 pounds of CVOCs from the vadose zone. Due to the persistent presence of perched water within the lower vadose zone, an alternative ERD injection event was performed to target residual CVOCs zone beneath the former source area. In 2018, Fishbeck proposed expanding the area of ERD treatment within the lower vadose zone and supplementing ERD with limited SVE remediation of impacted unsaturated soils primarily beneath the southwestern corner of the site building. In early 2019, the ERD expansion was completed through direct injection of emulsified vegetable oil (EVO), and the SVE system was reconstructed. Several new SVE wells were installed in and around the southwestern corner of the site building to address elevated concentrations of TCE detected in vadose soil and sub-slab soil gas in that area in 2017. Elevated perched groundwater levels facilitated highly successful ERD in the vadose zone and, conversely, prevented SVE in deeper vadose zone soils (20 to 40 feet below floor level) beneath the building. Elevated perched groundwater levels increased the vacuum required to move soil vapors through the treatment area, which ultimately led to blower failure in late 2019. Based on the success of the March 2019 injections and an even greater presence of perched water afterwards, Fishbeck proposed a combination of expanded perched groundwater ERD and limited SVE beneath the building to address the remaining vadose zone source. Injection activities were completed in January 2020. The SVE blower was replaced in March 2020 and the system returned to service, restoring vacuum beneath the floor in the southwestern corner of the building. The system has operated since to mitigate the potential accumulation of CVOC vapors and/or methane generated by ERD. Based on ERD performance monitoring results, the injections performed during the periodic presence of perched water have dramatically reduced CVOC concentrations in the perched water zone; remediation of lower vadose zone is essentially complete. In November 2022, EGLE provided conditional approval of Fishbeck's proposed plan for reducing groundwater monitoring at the site from semiannual sitewide events to alternating between focused annual monitoring events and sitewide biennial events.

Fishbeck is currently evaluating CVOC mass removal from the SVE wells in the southwestern corner of the site building to determine whether CVOC mass in vadose zone soils in that area has been removed to the extent practicable. Based on the results of that assessment, the SVE system may be shut down or converted to a sub-slab depressurization system with EGLE approval.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

Project 4 Reference Information:

Project Name: Graceland Fruit Bonney Disposal Site Investigation
Key Personnels: Dave Filipiak CHMM, Mike Apgar, Peter Lepczyk CPG, and Chris Carew
Project Address: US-31 and Covey Road
Project City/State/Zip: Honor, Michigan 49640
Owner/Client Contact Name and Telephone #: Dan Engler, Graceland Fruit – 231.352.7181

Project 4 Description:

Fishbeck was contracted to investigate and remediate a site with aesthetic impacts, elevated metals (iron, manganese, and arsenic), and elevated biological and chemical oxygen demand identified in the groundwater and nearby surface water. The impacts originated from the disposal of blueberry residuals into a former sand and gravel mining pit.

Affected soils were removed from the subsurface to a depth coincident with the water table to mitigate future leaching of residual sugars from the soil to the aquifer. This condition was causing a change to the redox conditions of the groundwater and was responsible for the mobilization of certain naturally occurring metals. An estimated 7,210 cubic yards of impacted soil were removed from the release area.

A new supply of drinking water was provided to five residents because of elevated concentrations of iron and/or manganese in groundwater samples. Bottled water was provided to the residents as an interim action, followed by the drilling of new water supply wells.

Fishbeck designed and managed installation, startup, and operations of an *in-situ* groundwater air sparging system for removal of residual biodegradable organic material and metals. The system was installed to remediate groundwater venting into an adjacent stream, which had shown both degraded surface water quality and aquatic organism habitat conditions. With continued sparging, the groundwater dissolved oxygen concentration and oxidation reduction potential have been elevated which in turn has resulted in the precipitation of iron, manganese, and arsenic within the aquifer and decreased venting of dissolved metals to the streams.

Fishbeck has worked with Graceland Fruit to restore groundwater venting to form the headwaters of a registered trout stream in northwestern lower Michigan. Stream restoration activities included a comprehensive investigation of groundwater contamination, source reduction, ecological stream assessment, and remediation activities. Ongoing ecological assessments are occurring, and include semiannual groundwater and surface water monitoring, and an annual stream biological assessment (performed by our subcontractor, Great Lakes Environmental Center) to determine the rate of groundwater and stream improvement.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has an extenstive history of successfully completing remediation projects under state and federal regualtory programs. We take pride in investigating, designing, constructing, and operating cost-effective and technically sound remedial solutions for our clients, including in-situ physical/chemical treatment. Our remediation team is broad and includes expertise in hydrogeology, engineering, microbiology, geochemistry, as well as other supportive disciplines. Our staff keep abreast of new technologies and methods through the attendance of symposia, conferences, trainings, webinars, and reading environmental/engineering journals.

Specific to this technology group, we have designed and implemented a large number of SVE, air sparge (AS), in-situ chemical oxidation (ISCO), and in-situ chemical reduction (ISCR) remedies throughout the United States during the past 10 years. We have relied on these technologies for the treatment of VOCs, CVOCs, and various metals.

Our general philosophy towards remedial design using in-situ physical/chemical treatment is like that of in-situ physical/biological treatment, which involves characterization of the treatment zone, identification of pathways and potential receptors, development of the CSM, establishment of remedial action objectives, and determination of approriate cleanup techologies. We have used these treatment technologies to both address sequestered contaminant mass in source areas as well as along points of compliance.

Our approach to designing SVE systems involves first assessing the vadose zone geology and soil and soil gas contamination, and then conducting pilot testing to determine specific design parameters such as radius of influence, vacuum, air flow rates, etc. We then use the findings of the pilot test to determine the blower size and design the treatment system for the extracted vapors. Once operational, we optimize our SVE systems by evaluating contaminant mass removal rates at individual SVE wells and adjusting flow rates.

Our approach to designing air sparge systems includes a detailed assessment of the distribution of contaminantion in the subsurface relative to lithological and hydrogeological observations. When approriate, pilot testing may occur to estimate the radius of influence per sparge point through the evaluation of transient groundwater mounding, increases in dissolved oxygen, etc. This occurrs more often on sites where AS and SVE are combined. We design and operate AS systems to promote optimpal partitioning of the dissolved and sorbed phases to the vapor phase. We accomplish this through an evaluation of the matrix permeability, and design data including air entry pressure, air flow, and ROI.

ISCO is a soil and/or groundwater remedial technology that introduces chemical oxidants into contaminated subsurface media to react with contaminants, resulting in the conversion of the contaminants into less harmful products. ISCO has often been compared to as a contact sport and focus must be on putting the oxidant in contact with the contaminant. Oxidants are not selective, as they oxidize both the contaminants and natural organic compounds found in the subsurface. Commonly, application of ISCO involves multiple injection events. The periods between injection events are typically on the order of months to a year. Fishbeck considers a variety of factors when selecting an oxidant, including geochemistry, contaminant type, and injection strategies. Various oxidants are available for ISCO projects that have different chemical properties, oxidation potential, and delivery systems that can be applied to site-specific conditions. Oxidants commonly applied in situ include potassium or sodium permanganate, persulfate, ozone, and hydrogen peroxide in the form of Fenton's Reagent. Care and consideration is also given to the method of delivery. Most often we have employed direct injection of reagents.

ISCR is similar to ISCO; however, instead of introducing chemical oxidants into contaminatmed environmental media, reducing agents are amended. Fishbeck staff have experience working with zero valent iron (ZVI) and sulfidated iron. We have used ZVI as both a standalone technology as well as in conjunction with other technologies such as a carbon donor (EZVI) or trap and treat technologies where it is combined with activated carbon (i.e. BOS-100). We first used a sulfer iron mix in 2015 to promote abiotic transformation at one of our ERD sites and have since recommended its use on additional sites.

3.2 Construction Oversight:

Fishbeck maintains dedicated staff who routinely provide construction oversight services for remediation projects. These trained and experienced individuals handle all aspects of construction oversight with projects involving general site work, demolition, drilling, piping, trenching, excavation, and treatment systems. To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor

- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has abundant experience preparing operation and maintenance (O&M) manuals for remediation systems and subsequent O&M activities. Our staff of professionals has extensive O&M experience in a variety of in situ physical/chemical remedial designs including, but not limited to, AS, ozone sparging, SVE with ex situ treatment through granular activated carbon (GAC) or catalytic oxidation, ISCO, ISCR, and groundwater circulating wells.

Amongst our Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in a few of the referenced projects. For detailed information, see resumes.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm, including several which have relied upon in situ physical/chemical treatments. We have abundant experience with Part 213 site closure requirements, as defined under Section 21312a, Part 213, of NREPA, 1994 PA 451, as amended. Fishbeck has also been responsible for achieving site closures and no further actions for Part 201 sites, as defined under Section 20114d, Part 201, Environmental Remediation, of NREPA, 1994 PA 451, as amended. We have completed several approved site closure plans that have involved abatement of imminent risks followed by long-term performance monitoring.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by EGLE and have obtained Storm Water Management Operator certification from the EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review
- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Bailey Hannah Job Title: Hydrogeologist
Labor Classification: P2 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Environmental Science and Sustainability, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Mike Ranck Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16

Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 17

Name: Joel Henry Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geologic Sciences, Michigan State University; MS Science Education, Syracuse University; BS in Chemistry, Bucknell University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 18

Name: Brad Peuler, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 19

Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 20

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include our work at the MAHLE Industries Harvey Street Facility, presented above. Resulting from the innovations and success of our in-situ injection of calcium polysulfide to reduce the chromium to an immobile form, our staff presented on this topic at two separate conferences:

- Apgar, M., Gillett, B., and Lisiecki, J., "Hexavalent Chromium Remediation in Soil and Groundwater," Poster presented at the REMTEC Remediation Technology Summit, Chicago, Illinois, May 2011.
- Apgar, M., Gillett, B., and Wiley, K., "Hexavalent Chromium Remediation in Soil and Groundwater," Speaker, presented at the REMTEC Remediation Technology Summit, Westminster, Colorado, March 2015.

Another example of innovation was recently employed at the Bradford White Corporation site, presented as a project example elsewhere in our proposal where the project team recently investigated the abiotic degradation pathway through the sampling and analysis of various indicator parameters such as acetylene.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *In-Situ Physical/Chemical Treatment*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ SVE / Air Sparge ☒ Solidification / Stabilization ☒ Chemical Oxidation / Injection

☒ Permeable Reactive Barriers ☒ Environmental Fracturing ☒ Groundwater Circulating Wells

☐ Treatment Blankets ☐ Evapotranspiration Covers ☒ Directional Wells

☒ Carbon Substrate Injections ☐ Electrokinetic-enhanced Remediation ☒ Zero-Valent Iron Walls

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>20	>20	0
Construction Oversight	>20	>20	0
O & M	>15	>15	0
Closed	6	6	0
Used Treatment Train	>10	>10	0
2. Range of cost per project:			
Design Phase	$14k-$300k	$14k-$300k	0
Construction Phase	$200k-$1.8M	$200k-$1.8M	0
O & M Phase	$10k-$500k	$10k-$500k	0
Total Project Cost	$200k-$2M	$200k-$2M	0
3. Number of the above projects that were:			
Below Budget	-	-	0
On Budget	>20	>20	0
Over Budget*	-	-	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	5	5	0
Licensed Chemical Engineers	1	1	0
Geologists	6	6	0
Hydrogeologists	7	7	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	2	2	0
Biologists	3	3	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and

schedule. When projects do exceed the originally approved budget, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

In-Situ Physical/Biological Treatment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Bradford White Corporation – Source Area Clean-up of a Highly Impacted CVOC Release
Key Personnels: Bruce Gillett CPG, Fernanda Wilson PhD, Ali Dahlbacka, Mike Apgar, and Chris Carew
Project Address: 200 Lafayette Street
Project City/State/Zip: Middleville, Michigan 49333
Owner/Client Contact Name and Telephone #: John Heyboer and Tyler Caro, Bradford White – 269.795.3364

Project 1 Description:
An active manufacturing plant formerly used trichloroethene (TCE) to degrease metal parts before painting. A zone of dense nonaqueous phase liquid (DNAPL) existed approximately 30 to 33 feet beneath the active press room. A pilot chemical oxidation test was initially performed; however, very low permeability soils and limited access due to the machine presses, prohibited the distribution of the oxidants. In response to these conditions, the remediation

strategy was modified to use enhanced reductive dichlorination (ERD). The system was augmented with the injection of commercially available anaerobic bacteria. Full-scale application of an ERD system was implemented in 2004-2005. Since that time, additional limited injections of carbon substrate have been performed to sustain deeply reducing aquifer conditions. In 2015, iron sulfate was added to the carbon substrate which activated abiotic destruction of the CVOCs in addition to the biotic pathway. No indications of DNAPL remain; concentrations of TCE and its daughter products indicate only dissolved phase residual impacts remain.

A sub-slab SVE/SSD system was installed after full-scale ERD implementation to mitigate methane and CVOC vapors in the vadose soils beneath the project area. More recently, additional VI evaluation indicated expansion of the SSDS was warranted and was completed in 2022. O&M of the SSDS and monitoring of sub-slab soil gas are ongoing to prevent potential risks from vapor intrusion.

A groundwater capture system was installed prior to discovery of the primary TCE source area to mitigate additional offsite migration of the TCE in groundwater. Two separate plumes emanate from the source area; one plume is mostly captured by a conventional extraction well, the other plume is captured by a 300-foot-long, 20-foot-deep extraction trench installed by DeWind (Holland, Michigan). Extracted groundwater is treated by an air stripper and discharged to the Thornapple River under an NPDES permit. The capture system has remained active while the DNAPL plume is remediated. Mixing zone determination updates have been prepared for both plumes for the goal of pilot testing a shutdown of the extraction system.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

Project 2 Reference Information:

Project Name: PS Food Mart – Hillsdale (Convenience King Group)
Key Personnels: Paul French
Project Address: 27 East Carleton Road
Project City/State/Zip: Hillsdale, Michigan 49242
Owner/Client Contact Name and Telephone #: Jim Linton, Folk Oil Company – 517.568.4114

Project 2 Description:

The subject property has operated as a gasoline filling station and/or petroleum storage facility since the mid-1940s. A release was reported for the facility in 2004 during the decommissioning of the site and removal of underground storage tanks (USTs). Limited source removal was conducted during the UST removals.

Results from site assessment activities indicated the presence of petroleum contaminants in soil, groundwater and/or soil gas beneath the site at concentrations that were not protective of the drinking water, groundwater/surface water interface, soil saturation and volatilization to indoor criteria. Subsequent environmental investigations indicated that a resulting groundwater contaminant plume extended beneath the adjacent state highway/street and an adjacent MDOT-controlled rail yard. The toe of the groundwater plume from the PS Food Mart site also extended to the source area of an adjacent leaking UST facility and comingled with the downgradient groundwater plume.

Monitored natural attenuation was initially selected as the remedial approach for the site; final closure was to be accomplished utilizing institutional controls once the groundwater plume had receded to the property boundary. Following several years of groundwater monitoring, an alternative remedial approach (Enhanced Bioremediation utilizing Oxygen Release Compound [ORC]) was initiated at the site to minimize long-term monitoring costs and to facilitate attenuation of the groundwater contaminants and retreat of the groundwater plume, with the primary objective to create a distinction between the subject and downgradient plume which had not been delineated.

ORC installation included the injection of 5,785 pounds of ORC-Advanced across the impacted area on the subject property into 74 vertical soil borings across the former (unpaved) tank location area and six horizontal borings

beneath the west (paved) portion of the site. Post-injection monitoring results indicated an 85% decrease in overall contaminant concentrations in the first sampling event following ORC installation. Contaminant concentrations at the toe of the PS Food Mart groundwater plume decreased to the Tier 1 RBSLs within one year following installation, allowing adequate separation of the two groundwater plumes.

Envirologic (now Fishbeck) achieved closure of the site utilizing environmental license agreements (ELAs) for the adjacent MDOT rights-of-way, as well as groundwater and (vapor intrusion) building restrictions on the site and downgradient property. The ELAs and restrictions were designed to incorporate the areas impacted by the downgradient release in order to avoid duplication of efforts when the downgradient property is closed.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- Indoor Air/Vapor Intrusion
- In-Situ Physical/Biological Treatment
- Alternative Technologies/Post Remediation Strategies

Project 3 Reference Information:

Project Name: Former Teledyne Semiconductor and Spectra-Physics Lasers, Inc. Sites
Key Personnels: Ali Dahlbacka and Michael Apgar
Project Address: 1300 Terra Bella Avenue
Project City/State/Zip: Mountain View, California 94043
Owner/Client Contact Name and Telephone #: Edgard Bertaut – 301.526.1710

Project 3 Description:

Prior to Fishbeck's involvement, a pump-and-treat (P&T) system operated at this site for nearly 20 years (1986 to 2005) to contain and treat groundwater impacted by historical releases of chlorinated volatile organic compounds (CVOCs). Though groundwater P&T was the remedy specified in the Record of Decision (ROD) for this site, the P&T system did not eliminate or dramatically reduce CVOC concentrations in groundwater within the remnant source area. Based on the results of an enhanced reductive dechlorination (ERD) pilot study conducted by others between 2005 and 2008, Fishbeck proposed utilizing a large-scale ERD strategy to accelerate source area remediation. With regulatory approval, Fishbeck designed and implemented a full-scale ERD treatability study in the source area of this site to reduce CVOC concentrations in groundwater sufficiently to 1) end active groundwater remediation onsite, 2) reduce long-term vapor intrusion (VI) exposure potential for site occupants, and 3) augment distal plume monitored natural attenuation (MNA) (monitored by others).

Since 2011, five injection events have been conducted to distribute emulsified vegetable oil (EVO) and amendments (i.e., pH buffering agent, bioaugmentation culture, and nutrients) throughout the ERD treatment area using a combination of direct injection and injection/recirculation. Performance monitoring has been conducted semiannually or more frequently since 2011. By 2016, performance monitoring results indicated that 99% of the original known CVOC mass had been destroyed. In 2018, the northern portion of the property transitioned from ERD performance monitoring to MNA. The fifth injection event, which was performed in 2022, incorporated zero-valent iron to add an abiotic dechlorinating pathway. Relative to 2021, concentrations of daughter products have decreased by up to two orders of magnitude. USEPA is preparing the draft amended ROD, which will formally change the site remedy from P&T to ERD followed by MNA in the source area and MNA in distal plume areas.

In 2011, a methane mitigation system (MMS) was installed along the northwestern property boundary by others to address soil gas methane generated as a byproduct of ERD. In 2013, the MMS was expanded to include the southwestern corner of the site building where ERD was and continues to be most robust. Fishbeck has operated and maintained the MMS since mid-2018. During this time, Fishbeck reviewed soil gas data collected in the northern portion of the building, which suggested the presence of a shallow source of TCE in unsaturated soil. Due to concerns from regulators regarding VI potential, Fishbeck designed a soil vapor extraction (SVE) system for that area. As part of this work, Fishbeck developed a plan for a shutdown test to demonstrate that operation of the MMS was no longer necessary; thus, its components could be repurposed for the proposed SVE system, eliminating

costs associated with a new blower package and minimizing conveyance piping. The results of the MMS shutdown test demonstrated that methane mitigation was no longer necessary and that neither methane nor CVOCs are impacting indoor air quality in the southern portion of the site building. With regulatory approval, operation of all but three of the MMS extraction wells was terminated in late 2021. In 2022, following the installation of eight SVE wells and six new soil vapor probes (SVPs) in the northern portion of the building, a 1-month pilot test was conducted using temporary conveyance lines assembled at floor level. Data recorded throughout the pilot test demonstrated the pervasiveness of SVE-induced vacuum throughout the target treatment area, and photoionization detector readings indicated that the SVE wells dramatically reduced total VOC concentrations in soil gas. In 2023, Fishbeck will conduct indoor air monitoring with the building heating, ventilation, and air conditioning (HVAC) system turned off to confirm the conclusion that sufficient CVOC mass has been removed to eliminate the potential for VI above screening criteria.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck is well qualified to deliver the scope of services described in the RFP for In-Situ Physical/Biological Treatment. This opinion is supported by the multiple bioremediation and monitored natural attenuation projects we have performed throughout the United States during the past 10 years. We have designed In-Situ Physical/Biological Treatment remedies for VOCs, CVOCs, and various metals. We began utilizing biological solutions to remediate VOCs in the 1990s. Although we still rely on this technology for VOCs, much of our environmental team's work in recent years has focused on sites where the primary concerns are related to the presence of CVOCs. To this end, we have designed several full-scale enhanced reductive dichlorination (ERD) remedies and natural attenuation programs for PCE, TCE, and their associated breakdown products.

As an environmental consultant, we place high emphasis on locating and characterizing the contaminant source area(s) for this simple reason: if you do not address abatement or control of the source, it will continue to leach chemicals to the groundwater and the problem will languish for decades to come. Our approach to remedial design typically begins with: (1) review and evaluation of historical data to build a conceptual site model (CSM), (2) development of a work plan for further investigation and delineation of the contaminant source area(s), if required, (3) collection of additional data and refinement of the CSM, if required, and (4) evaluation of all the data to determine the potential remedies and select the best one for the client, public, and environment, often through a detailed feasibility study.

Many of our remedial designs involve implementing source reduction through bioremediation. Depending on the COC, this is accomplished through either biostimulation (such as supplementing a terminal electron acceptor like oxygen in the case of many VOC impacted groundwater sites) or bioaugmentation (inoculating with particular microorganisms to degrade target compounds (e.g. dehalococcoides for CVOC sites) accompanied with substrate ammendment. Our remedial designs rely on an evaluation of a wide variety of information. Depending on the contaminant and complexity of the problem, the assemblage and assessment of data may include, but is not limited to, contaminant concentrations, geochemical parameters (pH, ORP, DO, TDS, etc.), dissolved gases (ethane, ethene, hydrogen, carbon dioxide, methane), metals (e.g., iron, etc.), major anions and cations (e.g., bicarbonate, chloride, sulfate, sodium, calcium, magnesium, and potassium), and hydrodynamics (e.g., porosity, groundwater velocity, etc). This information is then considered during the basis of design to determine the most suitable method for amendment delivery (e.g., direct inject, permanent injection wells, recirculation wells, etc), the spacing of injection points, amendment types and concentrations, and injectate volumes or recirculation volumes. Often times, bench scale testing is also completed to determine certain design parameters and ensure the efficacy of the design.

As highlighted in our project examples, our ERD systems often entail the construction of biocurtains or permeable barriers, comprised of multiple rows of permanent or temporary wells, oriented perpendicularly to groundwater flow. Delivery of emulsified vegetable oil (EVO) occurs through the simultaneous injection of groundwater and EVO into one well while extracting groundwater from the adjacent well(s), thus creating subsurface recirculation loops. Once the EVO has been injected, the well pairs are recirculated to further distribute the EVO into the less permeable strata and increase contact with the affected soils.

Once the source of contamination has been successfully addressed, many of our projects transition to a natural attenuation polishing step. In other cases, such as low-concentration, disperse groundwater impacts where no exposure pathways and receptors are present, a project may forgo active remediation and rely solely on natural processes. We utilize a tiered approach to design our natural attenuation remedies and rely on multiple lines of evidence that consider both biotic and abiotic processes. In addition to the suite of data described above, depending on the project, additional physical properties are considered, including fraction organic carbon, specific density, and magnetic susceptibility. We have also implemented the use of molecular biological tools, such as quantitative polymerase chain reaction (qPCR) and stable isotope probing (SIP) for the identification of key microorganisms or enzymes. Additionally, compound specific isotope analysis (CSIA) is a tool in our toolbox that we have used on several sites to demonstrate that degradation is occurring. Our MNA designs are created to obtain critical data to ensure that human health and the environment are being protected. This involves designing a monitoring program that provides strategic data to assess the protectiveness and progress of the remediation. When appropriate, trend analysis, linear regression analysis, analytical model development (e.g., Biochlor), and numerical reactive transport models (e.g., MDOFLOW/RT3D) are employed.

3.2 Construction Oversight:

Fishbeck staff routinely provide construction oversight on our In-Situ Physical/Biological Treatment projects. We work with drilling contractors to direct and oversee the installation of injection/recirculation wells, development of wells, injection of amendments during our direct inject designs, etc. On many of our full-scale permanent injection well systems, we provide the construction services and equipment for the actual injection of amendments (e.g., pumps, manifolds, pressure gauges, flow meters, etc.). In general, our direct injection projects are designed in house; however, the actual field implementation is completed by a drilling contractor under the direct supervision of a field engineer.

Additional oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport and disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer’s set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor’s hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor’s pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has abundant experience preparing operation and maintenance (O&M) manuals for remediation systems and subsequent O&M activities. Within this MDTMB contract, it is handled under Phase 900 Operation and Maintenance Services – Remediation Facility.

One advantageous aspect of In-Situ Physical/Biological Treatment projects is that they often require little ongoing operation of maintenance activities, aside from monitoring. Our active bioremediation projects entail up front and periodic operational needs during injections. However, in general there is not continual physical processes occurring that necessitate ongoing O&M.

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in a few of the referenced projects. For detailed information, see resumes.

3.4 Site Closure:

Many of our In-Situ Physical/Biological Treatment projects are ongoing. Our primary goal is typically to destroy or control the primary source area(s) to cut-off or prevent future exposure to humans and/or environment. This approach has facilitated the closure of smaller Part 201 and Part 213 sites either as unrestricted or restricted closures. Regarding larger plumes where multiple offsite properties have been impacted and cleanup times are correspondingly longer, our strategy is still destruction or control of the source area(s) to “cut-off” further contribution of contaminants to the plume. When successful mitigation or destruction of the source area is accomplished, the project can commonly transition to an MNA remedy where ongoing monitoring verifies that the plume is diminishing and exposure does not pose a risk. Fishbeck has been successful in executing numerous source area remediation projects where the benefits are being documented at downgradient, offsite properties. Such a strategy can still require additional offsite controls (e.g., vapor intrusion mitigation) while the plume concentrations decrease. Our project profiles provide more information on the described closure approaches.

For detailed information, see project summaries.

3.5 Soil Erosion and Sedimentation Control:

This topic is generally not applicable for this technology. However, when it is, Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan’s Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by EGLE and have obtained Storm Water Management Operator certification from EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans

- Site plan review
- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Mike Ranck Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Brad Peuler, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include the recent attendance at the 2018 Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds by two of our key personnel and our membership in various Interstate Technology Regulatory Council (ITRC) teams, most recently the 2018 PFAS group.

We have a dedicated staff of scientists, engineers, and regulatory specialists that help us evaluate the many facets to solving environmental problems in a cost-effective manner that can ultimately deliver value to our clients while bettering the environment and society. We also strive to obtain and retain talented staff who are considered experts in their respective fields. For example, we have a PhD-level environmental engineer with a background in in situ and ex situ biological and chemical treatment techniques.

Fishbeck has numerous special qualifications related to our work with In-Situ Physical/Biological Treatment. We have designed and implemented a mobile amendment delivery/recirculation system that we have utilized at numerous sites across the country. This system design was briefly described in Article 3 above. An example of this innovation was presented at the 9th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey,

California May 20, 2014 (Lepczyk, P., Colvin, M., Apgar, M. and Bertaut, A., A Full-Scale Biotreatability Study at Former Teledyne Semiconductor/ Spectra Physics Superfund Site in Mountain View, California).

Other presentation and publications by Fishbeck staff related to In-Situ Physical/Biological Treatment include the following:

- Lepczyk, P., Greene, D., Colvin, M., and Murphy, P., "Demonstration of Natural Attenuation of Chlorinated Ethenes through the Use of an Improved Conceptual Site Model, Compound-Specific Isotope Analysis, and Magnetic Susceptibility, "Platform presentation at the 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, Florida, May 19, 2015.
- Wilson, Fernanda. P. Winning paper at the 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, Florida, May 19, 2015.
- Lepczyk, P., Greene, D., Colvin, M., and Murphy, P., "Demonstration of Natural Attenuation of Chlorinated Ethenes through the Use of an Improved Conceptual Site Model, Compound-Specific Isotope Analysis, and Magnetic Susceptibility, "Platform presentation at the Michigan AIPG 5th Annual Workshop on Site Characterization, June 17, 2015.
- Paes Wilson F., Liu, X., Mattes, T. E., and Cupples, A. M. 2016. Nocardioides, sediminibacterium, aquabacterium, variovorax, and pseudomonas linked to carbon uptake during aerobic vinyl chloride biodegradation. Environmental Science and Pollution Research. 23: 19062-19070.
- Paes Wilson, F., and Cupples, A. M. 2016. Microbial community characterization and functional gene quantification in RDX degrading microcosms derived from sediment and groundwater at two naval sites. Applied Microbiology and Biotechnology, 100: 7297-7309.
- Paes, F., Liu, X., Mattes, T. E., and Cupples, A. M. 2015. Elucidating carbon uptake from vinyl chloride using stable isotope probing and Illumina sequencing. Applied Microbiology and Biotechnology. 99: 7735-7743.
- Lab scale studies for VC bioremediation using a mixed cultures developed from groundwater samples of a contaminated site located in Carver, Massachusetts (NSF Grant 1233154 Stable Isotope-Based Differentiation of Vinyl Chloride Assimilators from Co-metabolizers in Contaminated Groundwater).

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *In-Situ Physical/Biological Treatment*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Bioremediation ☒ Monitored Natural Attenuation ☐ Phytoremediation ☒ Bio-Sparge

☒ Enhanced Bioremediation (e.g., Propane Sparging, Electrokinetic, Enhanced Reductive De-chlorination)

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>20	>20	0
Construction Oversight	>20	>20	0
O & M	>10	>10	0
Closed	4	4	0
Used Treatment Train	>10	>10	0
2. Range of cost per project:			
Design Phase	$15k-$150k	$15k-$150k	0
Construction Phase	$80k-$1.5M	$80k-$1.5M	0
O & M Phase	$15k-$100k	$15k-$100k	0
Total Project Cost	$100k-$1.7M	$100k-$1.7M	0
3. Number of the above projects that were:			
Below Budget	-	-	0
On Budget	>20	>20	0
Over Budget*	-	-	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	1	1	0
Licensed Civil Engineers	5	5	0
Licensed Chemical Engineers	0	0	0
Geologists	3	3	0
Hydrogeologists	6	6	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	2	2	0
Biologists	1	1	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and schedule. When projects do exceed the originally approved budget, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Ex-Situ Physical/Chemical Treatment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Raymond Road Project (Davis Oil Company)
Key Personnels: Paul French
Project Address: 924 N. Raymond Road
Project City/State/Zip: Battle Creek, Michigan 49041
Owner/Client Contact Name and Telephone #: Jim Davis/Davis Oil – 265.965.2201

Project 1 Description:
A release from a former service station and bulk plant at this facility resulted in a groundwater/non-aqueous phase liquid (NAPL) plume that extended beneath an adjacent road and onto a downgradient property owned by a major food distribution center. Soil borings and monitoring wells were installed to delineate the extent of soil and

groundwater contamination. Envirologic (now Fishbeck) utilized LIF-UVOST and Oil-in-Soil Kits to delineate the extent of the NAPL body.

The NAPL and groundwater plume at this site was determined to intersect a shallow storm sewer system on the downgradient property. Upon discovery, our team coordinated with the adjacent property owner to implement a plan to remove grossly impacted materials near the storm sewer. During the process, we designed and installed a new watertight storm sewer system across the impacted area. Concurrently, we designed, constructed, and operated a remedial system to contain and treat groundwater and NAPL impacts across the impacted area. The remedial system included dual phase groundwater/NAPL extraction and treatment, as well as soil vapor extraction. A total of 1,021 gallons of NAPL was recovered and disposed offsite; 2.8 million gallons of contaminated groundwater was treated via aqueous phase carbon and discharged under permit to the local municipal sanitary sewer. Soil vapors were initially treated via a catalytic oxidizer and discharged under an air discharge permit; vapors were subsequently treated via vapor phase carbon once soil gas concentrations subsided.

Subsequent monitoring results indicate that all recoverable NAPL has been removed from the site and that the groundwater plume is undergoing attenuation and receding. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has concurred with a closure plan that will include an alternative mechanism for the adjacent roadway, as well as groundwater use and vapor intrusion building restrictions on the impacted properties.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- Ex-Situ Physical Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: Radiant Services Corporation and Former Teledyne/Aeroquip Site
Key Personnels: Peter Lepczyk CPG, Michael Apgar, Chris Carew, and Ali Dahlbacka
Project Address: 651 West Knox Street
Project City/State/Zip: Gardena, California 90248
Owner/Client Contact Name and Telephone #: Edgard Bertaut – 301.526.1710

Project 2 Description:
In 2017, Fishbeck was contracted to rapidly implement an approved Remedial Action Plan (RAP) at a site impacted with chlorinated volatile organic compounds (CVOCs), primarily tetrachloroethene (PCE) and its associated breakdown products (i.e., the contaminants of concern [COCs]). Historical operations at the site included the machining, cleaning, and plating of aerospace hardware and fasteners. The site is currently operating as a large-scale commercial laundering facility. The RAP prescribed the following cleanup methods: 1) soil vapor extraction (SVE) to reduce COC concentrations in the unsaturated zone, 2) in situ enhanced anaerobic bioremediation (ISEAB) to destroy COC mass in the shallow and intermediate groundwater zones, and 3) monitored natural attenuation (MNA) in the deep groundwater zone (greater than 100 feet below ground surface).

Fishbeck designed the SVE system, which included a network of 17 SVE wells, the majority of which were installed underneath the site building, to remove residual CVOCs and to serve as a sub-slab vapor mitigation system, if necessary. The SVE wells were connected to conveyance piping, routed to a system inlet manifold which was then connected to the blower system and vapor treatment system. Extracted vapors were treated using two granular activated carbon (GAC) adsorbers plumbed in series followed by a potassium permanganate-impregnated media reactor for the treatment of vinyl chloride, a COC at the site that is not efficiently adsorbed by GAC. Fishbeck oversaw construction of the system as well as routine operation and maintenance activities. Based on photoionization detector readings and flow measurements recorded throughout system operation, the SVE system removed an estimated 800 pounds of volatile organic compounds from the unsaturated zone prior to shutdown in March 2021, with regulatory-approved closure pending.

Fishbeck has designed and implemented two ISEAB injection events at the site. The first full-scale injection event was performed using permanent injection/extraction wells (IEWs). A network of IEWs was installed in the source area beneath the north-central portion of the site and the western half of the building. Along the western property line, approximately perpendicular to groundwater flow, a row of IEWs was installed as a biobarrier to intercept elevated concentrations CVOCs prior to offsite migration. In 2017, 17,690 gallons (104,809 lb of organic matter) of EOSPro, an emulsified vegetable oil (EVO) product, were distributed throughout the target treatment areas; 1,176,098 gallons of groundwater were recirculated to distribute the EVO within the shallow and intermediate water-bearing zones. Bioaugmentation was completed at each IEW using 1 liter of BAC-9 inoculum (a proprietary mixture of dehalogenating organisms) followed by approximately 25 gallons of anaerobic water prepared onsite. In 2021, Fishbeck implemented a more robust, focused ISEAB injection event to remediate the areal extent of shallow groundwater exhibiting PCE and trichloroethene (TCE) concentrations greater than 1,000 micrograms per liter (µg/L). During this second ISEAB injection event, a total of 6,076 gallons of EDS-ER™ were amended to 205,000 gallons of municipal water (for a total of 211,150 gallons of a 3% EVO solution, by volume of EDS-ER) and injected into the shallow groundwater zone via 11 existing IEWs installed in the shallow groundwater zone and 38 direct push injection boreholes. Bioaugmentation was performed concurrent with the injections; 1 liter of KB-1 inoculum was used at each injection location, along with anaerobic water prepared onsite.

Fishbeck performed a 3-year MNA study to evaluate the conditions of the deep groundwater zone. Quarterly groundwater monitoring was performed to evaluate concentrations of VOCs and MNA parameters. Additionally, during monitoring well installation, samples were collected for laboratory analysis of magnetic susceptibility and fraction organic carbon.

The following remedial technologies were utilized in this project:

- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- In-Situ Physical/Biological Treatment
- Ex-Situ Physical Chemical Treatment

Project 3 Reference Information:

Project Name: Windward Pointe/Pure Muskegon Development
Key Personnels: Mike Apgar, Fernanda Wilson PhD, and Chad Weber PE
Project Address: Lakeshore Drive at Lincoln Street
Project City/State/Zip: Muskegon, Michigan 49440
Owner/Client Contact Name and Telephone #: Charles (Trip) Johnson III – 231.557.7055

Project 3 Description:
Fishbeck was hired to be a part of a collaborative team that included local business and government leaders in the Muskegon area to help navigate this 120-acre, former paper mill site's complex environmental issues, leverage tax incentives and grants, maintain synergy between the project stakeholders, and advance redevelopment efforts. The stakeholders included an investment group known as Pure Muskegon, the City of Muskegon, and Muskegon County. Fishbeck's initial tasks included review of historical environmental information and performance of additional investigation to address data gaps in the conceptual site model. Based on these findings, an assessment of remediation options and costs was prepared and various interim response activities were implemented.

Although historical studies had concluded that the environmental liability at the site was minimal, Fishbeck found previously unidentified impacts such as hazardous levels of gases (methane, hydrogen sulfide), ammonia, and PFAS that would pose an impediment to redevelopment if not addressed. Fishbeck performed a targeted feasibility study that evaluated a number of innovative groundwater treatment technologies including the use of site derived materials (lime and coal) to potentially reduce PFAS and sulfate concentrations, stabilization treatment methods, and traditional groundwater recovery techniques. Fishbeck and the prospective developer secured a $5 million State of Michigan grant to be utilized for cleanup of groundwater to the extent practical within a two-year timeframe. Based on these constraints, a groundwater extraction/flushing approach was implemented comprising a network of extraction wells and infiltration trenches within the inferred source areas. Fishbeck performed the system design, soil erosion permitting/compliance, construction oversight, and O&M. During 2019 and 2020,

extracted groundwater was treated utilizing an ex-situ carbon adsorption system for removal of PFAS, TOC, and sulfate. The system included a surge tank, sand filter vessels, bag filters for particulate removal, four 20,000-pound adsorbers, and associated pumps, piping, etc. The design flow rate was 1,000 gpm and the treated groundwater was discharged to a network of onsite infiltration trenches and the Muskegon County Wastewater Management System. The groundwater extraction system was operated for approximately one year, treating more than 74 million gallons of groundwater, and achieved substantial decreases in contaminant concentrations over this timeframe.

To supplement the groundwater extraction/flushing approach, Fishbeck also performed a field-scale treatment demonstration utilizing a 500,000-gallon treatment pond. Removal of PFAS and other contaminants was achieved by circulating adsorbent media within the pond to perform a 2-stage treatment process comprised of powered activated carbon (PAC) and a commercial aluminum oxide-based reagent designed to target PFAS constituents (RemBind®). The first stage of treatment using PAC was necessary to reduce high dissolved organic carbon concentrations, which during pilot testing were found to reduce the RemBind's PFAS removal efficiency. The treatment process was implemented successfully, achieving 85-90% removal of PFAS compounds. Based on these findings, application of the process on a broader scale at the site was also being considered.

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- In-Situ Physical/Chemical Treatment
- Ex-Situ Physical Chemical Treatment
- Per-and Polyfluoroalkyl Substances (PFAS) Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has a long history of successfully completing remediation projects under state and federal programs. We take pride in investigating, designing, constructing, and operating cost-effective remedial solutions for our clients. Many of our multifaceted remediation projects involving soil and/or water treatment utilize one or more of the designated ex-situ physical/chemical treatment technologies. Our project teams are experienced in the selection of the most cost-effective means of assembling a treatment system capable of meeting the project treatment goals. Careful consideration of the cost of operating and maintain systems is made during the design development phase to ensure the treatment systems can be maintained properly.

Fishbeck's design philosophy is to involve prospective equipment vendors early in the design development phase to make use of their expertise and enable the use of pre-designed/off-the-shelf units to the extent practical. This approaches typically reduces the capital cost of the systems and reduces equipment lead times. Fishbeck also involves system operators during the design phase to identify potential O&M complications such that design modifications can be made to reduce long-term O&M and overall project costs.

A brief breakdown of our experience and typical services includes:

- Development of remedial strategies and design concepts.
- Preparing and conducting bench-scale testing, if needed, to demonstrate technological suitability of the selected treatment strategy.
- Detailed design of systems and procedures.
- Production of design documents.
- Preparation and dissemination of bidding documents.
- Development and execution of cost-effective design/build strategies.
- Construction/demolition inspection, oversight, and management.
- Compliance monitoring and air sampling during construction/demolition.

Fishbeck has expertise in the following ex-situ physical/chemical treatment remediation strategies:

- Air stripping
- Granular activated carbon (GAC)
- Synthetic selective adsorptive media/reagents
- Pump and treat
- Advanced oxidation (oxidant impregnated media, Fenton's reagent)
- Catalytic oxidation
- Performance assessments (e.g., system performance evaluations, life cycle analysis, or program enhancement analysis).

Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division. Fishbeck is well-versed in providing services to MDTMB and the client agencies typically assigned to consultants for execution.

3.2 Construction Oversight:

Fishbeck staff routinely provide construction oversight on our in-situ physical/biological treatment projects. We work with drilling contractors to direct and oversee the installation of injection/recirculation wells, development of wells, injection of amendments during our direct inject designs, etc. On many of our full-scale permanent injection well systems, we provide the construction services and equipment for the actual injection of amendments (e.g., pumps, manifolds, pressure gauges, flow meters, etc.). In general, our direct injection projects are designed in house; however, the actual field implementation is completed by a drilling contractor under the direct supervision of a field engineer.

Additional oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport and disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will

confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has abundant experience preparing operation and O&M manuals for remediation systems and subsequent O&M activities. Our staff of professionals has extensive O&M experience in a variety of Ex-Situ Physical/Chemical Treatment remedial designs including, but not limited to, air stripping, GAC, pump and treat systems, advanced oxidation, and catalytic oxidation.

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Remedial O&M activities are also described on the included Project Profiles.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm, including several which have relied upon Ex-Situ Physical/Chemical Treatments. We have abundant experience with site closures under Part 213 and Part 201 no further actions and certificates of completion. We have completed several approved site closure plans that have involved abatement of imminent risks followed by long-term performance monitoring.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by EGLE and have obtained Storm Water Management Operator certification from EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review
- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan

Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Mike Ranck Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: Ali Dahlbacka Job Title: Environmental Engineer
Labor Classification: P2 College Degree(s): BS in Environmental Engineering, Michigan Technological University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer

Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:
Project Name: N/A

Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end, innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We strongly focus on training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include the recent attendance at the 2022 Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds by three of our key personnel and our membership in various Interstate Technology Regulatory Council (ITRC) teams, most recently the PFAS group.

We have a dedicated staff of scientists, engineers, and regulatory specialists that help us evaluate the many facets to solving environmental problems in a cost-effective manner that can ultimately deliver value to our clients while bettering the environment and society. We also strive to obtain and retain talented staff who are considered experts in their respective fields, including PhD-level environmental engineering staff with a background in ex-situ chemical treatment techniques.

Many circumstances arise during the completion of environmental/remediation projects that require the assistance of an interdisciplinary team of experts and specialists. Fishbeck's core environmental/remediation staff is fortunate to be supported by other capable in-house staff. The other areas of expertise include:

- Electrical engineers
- Civil engineers
- Mechanical engineers
- Regulatory program specialists
- Structural engineers
- Industrial hygienists
- Construction estimators
- Construction managers
- Financial specialist
- Information technologists/specialists
- Surveying/Geospatial and GIS specialists

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: Ex-*Situ Physical/Chemical Treatment*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Air Stripping ☒ Granular Activated Carbon (GAC) ☒ Pump and Treat ☒ Advanced Oxidation

☒ Multi-Phase Extraction ☒ Catalytic Oxidation

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>10	>10	0
Construction Oversight	>10	>10	0
O & M	>10	>10	0
Closed	6	6	0
Used Treatment Train	>10	>10	0
2. Range of cost per project:			
Design Phase	$10k-$200k	$10k-$200k	0
Construction Phase	$80k-$4M	$80k-$4M	0
O & M Phase	$50k-$17M	$50k-$17M	0
Total Project Cost	$100k-$21M	$100k-$21M	0
3. Number of the above projects that were:			
Below Budget	-	-	0
On Budget	>10	>10	0
Over Budget*	-	-	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	10	10	0
Licensed Chemical Engineers	2	2	0
Geologists	3	3	0
Hydrogeologists	7	7	0
Licensed Surveyors	4	4	0
Licensed Electrical Engineers	2	2	0
Licensed Mechanical Engineers	2	2	0
Environmental Science	2	2	0
Biologists	1	1	0

*Provide explanation, including strategies implemented to fix the issue:

Please note, that our Ott Story project is a high dollar annual project that Fishbeck has been working on for over 15 years. Also, due to the number or staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and schedule. When projects do exceed originally approved budgets, Fishbeck strives to

identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Ex-Situ Physical/Biological Treatment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: City of Ludington WWTP
Key Personnels: Dave Filipiak, CHMM and Chad Weber PE
Project Address: 5160 West Sixth Street
Project City/State/Zip: Ludington, Michigan 49431
Owner/Client Contact Name and Telephone #: Chris Cossette, City of Ludington – 231.843.3190

Project 1 Description:
Fishbeck assisted the City with improvements to their WWTP and performance of a groundwater study to evaluate the nature and extent of impacts from historical discharges to a former sludge pond.

The City's WWTP consists of aerated lagoons, final clarifiers, and chlorination. Increased flow and industrial loading over recent years necessitated treatment improvements. Fishbeck designed and provided oversight of the

construction of WWTP improvements including a new headworks building with septage receiving, mechanical bar screen, and vortex grit removal; converting one of the existing lagoons to an equalization basin, two extended aeration treatment basins, and two biosolids storage basins; replacing final clarifier mechanisms; constructing a baffled/serpentine-walled chlorine contact tank and implementing dechlorination equipment; replacing clarifier feed pumps, return activated sludge pumps, treatment blowers, and the pumps at the main collection system pump station; and upgrading the electrical system and installing stand-by power generators. Construction activities, which were performed during 2020 and 2021, required the removal, stabilization, and offsite (landfill) disposal of PFAS-impacted sludge material. Fishbeck also helped the City obtain a low-interest loan from Michigan's Water Pollution Control Revolving Fund (State Revolving Fund, SRF).

In conjunction with the WWTP improvements, from 2019 through 2021, Fishbeck performed extensive hydrogeological studies to characterize PFAS, metals, and other wastewater-related impacts to groundwater resulting from historical use of an unlined sludge pond at the WWTP site. The hydrogeological studies were performed in accordance with EGLE-approved work plans. An incremental sampling approach was also implemented to characterize the soils beneath a former lagoon that was upgraded as part of the WWTP improvements. The hydrogeological studies identified groundwater impact extending across an approximate 0.4 square mile area. Fishbeck performed a groundwater remediation feasibility study which concluded that, given the absence of receptors within the area of impact, a groundwater use ordinance coupled with long-term monitoring was the preferred response activity.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Ex-Situ Physical/Biological Treatment
- Per-and Polyfluoroalkyl Substances (PFAS) Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: Ott Story Groundwater Treatment System
Key Personnels: Dave Conklin, PE
Project Address: 453 Agard Road
Project City/State/Zip: Muskegon, Michigan 49445
Owner/Client Contact Name and Telephone #: Priyank Patel, EGLE – 517.285.3724

Project 2 Description:

Fishbeck has operated the Ott/Story groundwater treatment facility since September 1999. Fishbeck manages a staff of four at the facility under a prime contract with the U.S. Army Corps of Engineers (USACE) through 2011 and under EGLE from 2011 to present. The treatment system was constructed to treat groundwater primarily contaminated with VOCs and SVOCs from the historical discharge of industrial wastewater and residuals into unlined seepage lagoons by a chemical manufacturer. The 1.35-million-gallon-per-day Ott/Story facility is the largest groundwater treatment facility in Michigan.

The treatment facility utilizes or has utilized the following unit processes:

- Groundwater collection using ten extraction wells
- Air stripping using aerators
- Powder activated carbon treatment
- Continuously backwashed pressure filtration
- Carbon adsorption
- Thermal oxidation for off gas treatment
- Sludge thickening
- Plate and frame filter for sludge dewatering
- Ferric chloride feed system
- Polymer feed system
- Oxycharger aeration system

Fishbeck is responsible for all aspects of operation, including:

- O&M of all treatment systems
- Groundwater sampling
- Operation of the extraction well systems
- Performing blended chemical heat treatment (BCHT) to rehabilitate the extraction wells
- Purchasing of chemicals, equipment, and supplies
- System optimization
- In-plant laboratory management and selected sample analysis
- Maintaining a computerized inventory and maintenance program
- Preparation of monthly State of Michigan Discharge Monitoring Reports and coordination with the USACE, USEPA, and the EGLE
- Coordinating work with other state and federal contractors

The following remedial technologies were utilized in this project:

- Migration Control, Fluid Removal, and Containment
- Ex-Situ Physical Chemical Treatment
- Ex-Situ Physical/Biological Treatment

Project 3 Reference Information:

Project Name: Forest Hills Public Schools/Eastern Operations
Key Personnels: Dave Filipiak, CHMM
Project Address: 2200 Pettis Ave NE
Project City/State/Zip: Ada, Michigan 49301
Owner/Client Contact Name and Telephone #: Mark Scoby, Forest Hills Public Schools – 616.293.5696

Project 3 Description:

Fishbeck has been familiar with the Forest Hills Eastern High School campus wetland system since 2006 and have been providing operations services for the system for the last fourteen years.

The treatment facility uses or has used all the following unit processes:

- Groundwater collection using seven monitor wells
- Two recirculation pumps
- Four tile field dosing pumps
- 3 septic tanks
- Associated controls for pumps

Fishbeck is responsible for all aspects of operation, including:

- Routine site visits to perform system inspections, wastewater sampling, and maintenance, as required in the discharge permit (Permit No. GW1610064)
- Preparation and electronic submittal of monthly reports to EGLE through the MiEnviro Portal, as required in the discharge permit
- Collection and analysis of quarterly groundwater samples, as required in the permit
- Routine maintenance of system equipment per manufacturer recommendations
- Optimization of the wetland treatment process with current equipment
- Coordination of septic tank pump-out as required

The following remedial technologies were utilized in this project:

- Ex-Situ Physical/Biological Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has a long history of successfully completing remediation projects under state and federal programs. We take pride in investigating, designing, constructing, and operating cost-effective remedial solutions for our clients. Fishbeck also has a history of innovation having developed and implemented state-of-the-art cleanup technologies/strategies. Several of our remediation and many of our wastewater projects involve ex-situ physical/biological treatment technologies. Our project teams include experienced environmental chemists, engineers, biologists, ecologists, hygienists, and hydrogeologists who keep abreast of new technologies and methods through the attendance of symposia, conferences, trainings, ITRC webinars, and reading of relevant environmental/engineering journals. A brief breakdown of our experience and typical services related to Bioreactors and Biopiles includes:

Design and Construction:

- Complete characterization of waste stream requiring treatment
- Development of remedial strategies and design concepts.
- Bench testing or pilot testing, as necessary.
- Working with experienced vendors on design elements.
- Detailed design of systems and procedures.
- Production of design documents.
- Preparation and dissemination of bidding documents.
- Development and execution of cost-effective design/build strategies.
- Construction inspection, oversight, and management.
- Compliance monitoring and air sampling during construction.
- Preparation of construction cost estimates.
- System performance evaluations.
- Life cycle analysis.
- Program enhancement analysis.

For more detailed information, see project examples and resumes.

3.2 Construction Oversight:

Fishbeck staff routinely provide construction oversight on our In-Situ Physical/Biological Treatment projects. We work with drilling contractors to direct and oversee the installation of injection/recirculation wells, development of wells, injection of amendments during our direct inject designs, etc. On many of our full-scale permanent injection well systems, we provide the construction services and equipment for the actual injection of amendments (e.g., pumps, manifolds, pressure gauges, flow meters, etc.). In general, our direct injection projects are designed in house; however, the actual field implementation is completed by a drilling contractor under the direct supervision of a field engineer.

Additional oversight activities include holding health and safety meetings, generation of soil boring/well logs, field documentation, photo logs, sampling records, directing field activities. In addition to overseeing drilling/injection work, our field personnel provide oversight on other activities including electrical contractors, utility locating contractors, waste transport and disposal, etc.

To ensure construction QA/QC is established, the following construction administration services (Phase 600) and construction field services (Phase 700) are included in the construction services we provide:

- Prepare a site-specific health and safety plan for Fishbeck staff
- Conduct daily onsite safety tailgate meetings
- Attend preconstruction and progress meetings
- Site visits

- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily logbook recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

As it relates to MDTMB-specific projects, Fishbeck has worked successfully with the agency on numerous State of Michigan projects under various types of contracts to provide construction oversight services. Fishbeck understands the MDTMB contracting mechanisms and various phases of work. For projects managed by the MDTMB, Fishbeck will confirm design and construction efforts comply with State Agency requirements as defined by the MDTMB Design and Construction Division.

3.3 Remedial O&M:

Fishbeck has abundant experience preparing operation and maintenance (O&M) manuals for remediation systems and subsequent O&M activities. Within this MDTMB contract, it is handled under Phase 900 Operation and Maintenance Services – Remediation Facility.

Our staff of professionals has extensive O&M experience in a variety of Ex-Situ Physical/Biological Treatment. Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in a few of the referenced projects.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm. We have abundant experience with Part 213 site closure requirements, as defined under Section 21312a, Part 213, of NREPA, 1994 PA 451, as amended. Fishbeck has also been responsible for achieving site closures and no further actions for Part 201 sites, as defined under Section 20114d, Part 201, Environmental Remediation, of NREPA, 1994 PA 451, as amended. We have completed several approved site closure plans that have involved abatement of imminent risks followed by long-term performance monitoring.

For detailed information, see project summaries.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites across the Midwest. Our staff is well-versed in Part 91 (Soil Erosion and Sedimentation Control) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, as well the Federal Clean Water Act and the USEPA National Pollution Discharge Elimination System (NPDES) Storm Water Program. We continue to serve as site

plan review engineers for municipalities and counties throughout Michigan. Our site inspectors have successfully completed SESC training by EGLE and have obtained Storm Water Management Operator certification from EGLE.

Specific areas of expertise regarding SESC include:

- Permitting
- Developing and administrating SESC plans
- Site plan review
- SESC inspection/enforcement

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- EGLE Class A-1i Industrial Site Storm Water Management Certification
- EGLE Industrial Storm Water Management Operator

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: David Conklin, PE Job Title: Senior Water and Wastewater Engineer
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: David Filipiak, CHMM Job Title: Environmental Engineer/Environmental Chemist
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck has numerous special qualifications related to our work with Ex-Situ Physical/Biological Treatment. We have worked with several companies in the food industry to design treatment systems for their waste streams whose discharges had previously resulted in environmental impacts.

Fishbeck provides high-end innovative technical solutions for projects that require remedial investigation, active remediation, hazardous condition abatement, mitigation of potential exposures to human health and/or the environment, and closure. We consider ourselves very practical yet innovative, and our projects demonstrate this. We invest significantly in training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include attendance at the 2018 Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds our key personnel and our membership in various Interstate Technology Regulatory Council (ITRC) teams, most recently the 2018 PFAS group. We have a dedicated staff of scientists,

engineers, and regulatory specialists that help us evaluate the many facets to solving environmental problems in a cost-effective manner that can ultimately deliver value to our clients while bettering the environment and society.

We also strive to obtain and retain talented staff who are considered experts in their respective fields. For example, prior to her employment at Fishbeck, Dr. Wilson, completed post-doctorate work on optimizing the operation and maintenance of bioreactors in a wastewater process and was involved in other related research. Her background also includes in-situ and ex-situ biological and chemical treatment techniques. Refer to her resume for additional information and publications.

Many circumstances arise during the completion of environmental/remediation projects that require the assistance of various experts and specialists. Fishbeck's core environmental/remediation staff is fortunate to be supported by other capable in-house staff. The other areas of expertise include:

- Electrical engineers
- Civil engineers
- Mechanical engineers
- Regulatory program specialists
- Structural engineers
- Industrial hygienists
- Construction estimators
- Construction managers
- Financial specialist
- Information technologists/specialists
- Professional surveyors and GIS specialists

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: Ex-*Situ Physical/Biological Treatment*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply)

☒ Bioreactors ☒ Biopiles

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	5	5	0
Construction Oversight	5	5	0
O & M	3	3	0
Closed	0	0	0
Used Treatment Train	3	3	0
2. Range of cost per project:			
Design Phase	$50k-$200k	$50k-$200k	0
Construction Phase	$50k-$22M	$50k-$22M	0
O & M Phase	$10k-$100k	$10k-$100k	0
Total Project Cost	$60k-$22M	$60k-$22M	0
3. Number of the above projects that were:			
Below Budget	-	-	0
On Budget	5	5	0
Over Budget*	-	-	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	8	6	0
Licensed Chemical Engineers	1	1	0
Geologists	0	0	0
Hydrogeologists	0	0	0
Licensed Surveyors	0	0	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	1	1	0
Biologists	1	1	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and schedule. When projects do exceed originally approved budgets, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Specialized Technologies Questionnaire
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Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Per- Polyfluoroalkyl Substances (PFAS) Treatment

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Billerud — Drinking Water PFAS Treatment System
Key Personnels: Fernanda Wilson PhD, Mike Apgar
Project Address: W6791 US Hwy 2
Project City/State/Zip: Quinnesec, Michigan 49876
Owner/Client Contact Name and Telephone #: Andrew Stalheim – 906.767.1997

Project 1 Description:
In December 2022, Billerud retained Fishbeck to address concentrations of per- and polyfluoroalkyl substances (PFAS) compounds above current Michigan PFAS Maximum Contaminant Levels (MCLs) in the potable water at their plant located in Quinnesec, Michigan in Dickenson County near the Michigan-Wisconsin state line. Since 2019, the site has been monitored for PFAS and results show the presence of Perfluorooctanoic acid (PFOA) slightly above

existing drinking water criteria of 8 parts per trillion (ppt). The project aims to evaluate available technologies and install a treatment system that will reduce the concentration of PFAS in the potable water system to concentrations below current MCLs for drinking water at a minimum, with a theoretical target level of below detection limits (non-detect) during normal operating conditions.

Currently, granulated activated carbon (GAC) and ion exchange (IX) technologies are being evaluated as effective options to treat drinking water at the Billerud site. The evaluation is based on three general criteria: 1) Ability to remove PFAS with respect to existing MCLs, 2) System size, 3) Likelihood of a rapid EGLE approval. Pre-design efforts considering site water conditions and demand are also being taken into consideration. A pilot study is planned for the summer of 2023 utilizing site water and specific pre-selected vendor technologies. After completion of the data review and the pilot study, Fishbeck will provide Billerud with a specific recommendation on treatment system configuration. This recommendation will include the rationale for selection of the recommended equipment, projected costs for purchase and installation of the system, and annual O&M costs. Fishbeck will oversee the system installation/startup and system testing.

Fishbeck is also assisting Billerud in navigating the Michigan drinking water regulations and permitting associated with the installation of the treatment system. In parallel, an alternative opinion of the probable cost for connection to a municipal water utility will also be prepared by a Fishbeck Professional Engineer.

The following remedial technologies were utilized in this project:

- Per-and Polyfluoroalkyl Substances (PFAS) Treatment

Project 2 Reference Information:

Project Name: City of Grand Rapids/Godfrey Reconstruction
Key Personnels: Mike Apgar
Project Address: Godfrey Avenue SW
Project City/State/Zip: Grand Rapids, Michigan 49503
Owner/Client Contact Name and Telephone #: Dan Siminski – 616.456.3000

Project 2 Description:
Fishbeck specified, bid, monitored, and provided reporting for a dewatering project associated with the reconstruction of Godfrey Avenue during the 2020 and 2021 construction season. PFAS, along with various volatile organic compounds, were identified in the groundwater. Fishbeck applied for and obtained permission to discharge, with treatment, to the City's sanitary sewer system. The treatment system consisted of four frac tanks, four bag filters, and two 5,000-pound contactors filled with granulated activated carbon.

Effluent samples were collected weekly. Effluent results and cumulative treated groundwater discharge were reported to the City monthly. 3.7 million gallons were collected treated and discharged to the City over the course of the project.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- Ex-Situ Physical Chemical Treatment
- Per-and Polyfluoroalkyl Substances (PFAS) Treatment

Project 3 Reference Information:

Project Name: City of Grand Rapids/ESTS Relocation Contracts 1&2
Key Personnels: Mike Apgar
Project Address: Market Avenue SW
Project City/State/Zip: Grand Rapids, Michigan 49503
Owner/Client Contact Name and Telephone #: City of Grand Rapids, Dan Siminski – 616.456.3000

Project 3 Description:
Fishbeck specified, prepared bid documents, monitored, and provided reporting for a dewatering project associated with the reconstruction of Market Avenue and Fulton Street during the 2021 and 2022 construction season. PFAS, along with various volatile organic compounds, were identified in the groundwater. Fishbeck applied for and held the permission to discharge permit, with treatment, to the City's sanitary sewer system. The treatment system consisted of six frac tanks, ten bag filters and four 10,000-pound contactors filled with granulated activated carbon.

Effluent samples were collected monthly. Effluent results and cumulative treated groundwater discharge were reported to the City monthly. 77 million gallons were collected, treated, and discharged to the City over the course of the project.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Migration Control, Fluid Removal, and Containment
- Ex-Situ Physical Chemical Treatment
- Per-and Polyfluoroalkyl Substances (PFAS) Treatment

Project 4 Reference Information:

Project Name: Robinson Elementary School — Drinking Water PFAS Treatment and Monitoring
Key Personnels: Fernanda Wilson PhD and Mike Apgar
Project Address: 11801 120th Avenue
Project City/State/Zip: Grand Haven, Michigan 49417
Owner/Client Contact Name and Telephone #: Jason MacKay – 616.850.5185

Project 4 Description:
In 2018, MPART executed a statewide sampling effort of communities, schools, childcare providers, and tribal water supplies for PFAS. Three sites had test results exceeding the USEPA Lifetime Health Advisory (LHA) of 70 ng/L for PFOA and PFOS – criteria used as reference at the time. Robinson Elementary School, part of the Grand Haven Area Public Schools (GHAPS) was one of these sites. Fishbeck assisted GHAPS to select, design, install, and test a treatment system to remove PFAS to concentrations to below current state PFAS MCLs. Fishbeck also helped GHAPS obtain a Drinking Water Contamination Remediation Grant from EGLE to offset a portion of the cost for installation of the PFAS treatment system and other improvements. Through coordination between Fishbeck, GHAPS, Ottawa County Department of Public Health, and EGLE state agencies, an Ion Exchange (IX) system was approved and installed at the school. After installation, an extensive program of sampling and analysis of both untreated and treated water for PFAS was executed following the permit requirements on a monthly and quarterly basis. This was necessary because this was the first IX system installed to treat PFAS in drinking water for the state of Michigan. Data accumulated over the nearly one-year PFAS testing period indicated a removal efficiency of 100% for all 18 PFAS telomers included in EPA Method 537.1. As a result of the successful demonstration period, on January 11, 2021, Ottawa County issued a letter to GHAPS approving the use of the treated water for human consumption. To date, PFAS has not been detected in treated water at the school. Fishbeck continues to operate, monitor, and assist GHAPS with the IX PFAS system.

The following remedial technologies were utilized in this project:

- Per-and Polyfluoroalkyl Substances (PFAS) Treatment

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:
Per- & Polyfluoroalkyl Substances (PFAS) is a contaminant of emerging concern that has been brought to the forefront of Michiganders in a number of high-profile cases. Fishbeck has been heavily involved in PFAS investigative sampling at numerous sites involving a variety of environmental matrices, including soil, groundwater, and surface water. As PFAS

sampling requires special attention to prevent cross-contamination, Fishbeck has developed a sampling SOP, best-practices checklists and constantly invests in the training of staff to ensure high quality and state of the art service to clients in this rapidly-changing area.

In order to coordinate investigative and remediation activities, Fishbeck has organized an internal multi-disciplinary PFAS technical practice group that includes geologists, environmental scientists, and environmental, chemical, water and wastewater engineers. This group continues to coordinate the sampling and investigation of PFAS-impacted sites, and develop appropriate design methods for the remediation of this emerging contaminant, while staying abreast of lessons-learned and new regulatory and technical developments.

Remediation of PFAS and related compounds can include mulitple treatment options including excavation and incineration, in-situ immobilization, filtration (nanofiltration and reverse osmosis), sorption (GAC), ion exchange, and various chemical treatments including oxidation, electro-, sono-, and photochemical applications and plasma mediated distruction. Fishbeck has experience with many of these remedial options, and has applied multiple remedial technologies (e.g. GAC, ion exchange) to conduct PFAS remediation at various sites. Specifically, at the Robinson Elementary School project descibed above, the remedial system implemented by Fishbeck was the first ion exchange installed to treat PFAS in drinking water in the state of Michigan.

3.2 Construction Oversight:

Fishbeck staff routinely conduct oversight activities of investigation, remedial construction and implementation, and follow-up sampling at contaminated sites to ensure the quality and consistency of field activities. For example, Fishbeck provided construction oversight of the remedial construction of the ion exchange and GAC PFAS treatment systems at the Robinson Elementary School and Grand Rapids projects descibed above. To ensure remediation system QA/QC is achieved, the following PFAS remediation construction oversight services have been provided:

- Attend preconstruction and progress meetings
- Coordinate subcontractor(s) and site personnel, and monitor construction progress
- Maintain as-built drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly records
- Verify that work has been completed completely and thoroughly by the contractor
- Conduct final inspections with site owner and contractor

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- EGLE Class A-1j Construction Site Storm Water Management Certification
- Permit Required Confined Space Entry trained

3.3 Remedial O&M:

Upon installation and operation of any PFAS treatment system, Fishbeck has preparing operation and O&M manuals for the remediation systems and subsequent O&M activities. Our staff of professionals has extensive O&M experience in a variety of in-situ and ex-situ physical/chemical treatment remedial systems including, but not limited to, various technologies applicable to PFAS treatment.

Amongst its environmental services division and the key personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Ongoing O&M activities are also highlighted in a few of the projects included in this proposal. For additional detailed information, see project summaries and personnel resumes.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm, including several which have relied upon treatment technolgies used for PFAS Treatment. We have abundant experience with site closures under Part 213 and Part 201 no further actions and certificates of completion while using these technologies. Regarding PFAS Treatment, some project summaries described above represent an abatement of imminent risks followed by long-term performance monitoring.

3.5 Soil Erosion and Sedimentation Control: Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites; however, this is generally not applicable to this technology.

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7
Name: Mike Ranck Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, New Mexico Institute of Mining and Technology; BS in Environmental Geology, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Zachary Curry Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology, Grand Valley State University; Precambrian Research Field Camp, University of Minnesota-Duluth
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Bailey Hannah Job Title: Hydrogeologist
Labor Classification: P2 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Environmental Science and Sustainability, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Fernanda Wilson, PhD Job Title: Environmental Engineer
Labor Classification: P3 College Degree(s): PhD and MS in Environmental Engineering, Michigan State University; Bachelor of Biology Science, Federal University of Ceara, Brazil
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A

Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____

Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides high-end, innovative technical solutions for projects that require PFAS investigation, remediation, and mitigation of potential exposures to human health and/or the environment. We consider ourselves practical yet innovative, and our projects demonstrate this. We strongly focus on training, education, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications. Examples of this include and attending and speaking at conferences such as the 2022 AWMA "The Science of PFAS: Transforming Research into Action" by one of our key personnel, and our membership in various Interstate Technology Regulatory Council (ITRC) teams, including the PFAS group by another one of our key personnel. The ITRC-PFAS team that Fishbeck participates on is responsible for the writing and review of factsheets and development of Technical and Regulatory Guidance.

We have a dedicated staff of scientists, engineers, and regulatory specialists that help us evaluate the many facets to solving environmental problems in a cost-effective manner that can ultimately deliver value to our clients while bettering the environment and society. We also strive to obtain and retain talented staff who are considered experts in their respective fields, including PhD-level environmental engineering staff with a background in PFAS treatment techniques.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Per- & Polyfluoroalkyl Substances (PFAS)*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply) ☒ Sampling ☒ Investigation ☒ Remediation ☒ Conventional Water/Wastewater Treatment (Activated Carbon, Ion Exchange Resin, Membrane Separation, Incineration) ☒ Sorption Technology ☐ Advanced Oxidation/Reduction ☒ Others.

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed (includes all Components/Technics above)	>30	>30	0
Construction Oversight	6	6	0
O & M (includes sampling)	>30	>30	0
Closed	0	0	0
Used Treatment Train	>20	>20	0
2. Range of cost per project:			
Design Phase	$5k-$250k	$5k-$250k	0
Construction Phase	$1k-$22M	$1k-$22M	0
O & M Phase	$500-$50k	$500-$50k	0
Total Project Cost	$5k-$22M	$5k-$22M	0
3. Number of the above projects that were:			
Below Budget	0	0	0
On Budget	>30	>30	0
Over Budget*	0	0	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	0	0	0
Licensed Chemical Engineers	1	1	0
Geologists	2	2	0
Hydrogeologists	6	6	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	1	1	0
Biologists	2	2	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the relative recent concern over PFAS, our professionals have been engaging in this topic for less than two years; however, our senior level staff and PhD environmental engineer/biologist have made development of PFAS expertise within Fishbeck a priority. Fishbeck PFAS professionals have participated in lectures, discussions, and presentations to professional organizations, associations, and physician groups. Fishbeck is also part of ITRC-PFAS team for the writing and review of fact sheets and the technical and regulatory guidance, currently under development. The ITRC-PFAS team have released fact sheets on naming convention, history and use, fate and transport, site characterization (including

sampling and investigation), regulations, and remediation. An additional fact sheet on firefighting foam (AFFF) is currently being developed.

Fishbeck actively participates in meetings and conferences where PFAS current issues and available solutions are discussed. That includes, but it is not limited to, MDEQ meetings, RemTech 2018, Battelle 2018, and ITRC Spring meeting 2018.

Specialized Technologies Questionnaire
for Professional Environmental Consulting Services
Department of Technology, Management and Budget
2023 Indefinite-Scope Indefinite-Delivery – Expanded Environmental Remediation Services

Part II

Select Remediation Technology below: (submit one form for each specific technology below)

Alt Tech/Post Remediation Strategies

INSTRUCTIONS: Professionals shall complete the following required information in the form provided. A separate sheet may be used if additional space is needed. Professionals are to ensure all questions are answered completely in the most concise way possible to streamline the review process.

ARTICLE 1: BUSINESS ORGANIZATION

1.1 Business Organization Full Name: Fishbeck

ARTICLE 2: PRIOR EXPERIENCE

2.1 Provide a client reference and brief descriptions of at least three (3) projects in the last ten years related to the work associated with this technology. Name the currently employed key personnels assigned to each project. Emphasis shall be placed on recent work at sites of environmental contamination and on sites where the Professional has provided significant contributions:

Project 1 Reference Information:

Project Name: Former Detrex Facility
Key Personnels: Derrick Lingle CPG, David Warwick, Kayla Rooney, and Paul French
Project Address: 312 Ellsworth Avenue SW
Project City/State/Zip: Grand Rapids, Michigan 49503
Owner/Client Contact Name and Telephone #: Elizabeth Schlaeger, Commercial Development Corporation – 314.307.1734

Project 1 Description:
Envirologic (now Fishbeck) was retained to implement a complex scope related to site investigation, vapor intrusion mitigation, and remediation at the former Detrex facility. Operations took place between 1970 and 1996 and consisted of the sale of halogenated hydrocarbon solvents as well as the collection of solvent wastes from various

industries. The former Detrex building is situated in a densely developed portion of downtown Grand Rapids and is currently utilized as a photography studio.

Fishbeck identified significant concentrations of trichloroethene (TCE) in sub-slab soil gas and indoor air at the facility in 2016, at which point the building was temporarily evacuated and the U.S. Environmental Protection Agency (EPA) overtook regulatory oversight. Fishbeck designed and oversaw the installation of a vapor mitigation system (VMS), which provides sub-slab vacuum coverage for the facility and two adjacent buildings as well as a sub-membrane depressurization for an earthen crawl space. The VMS was designed to mimic a soil vapor extraction system (extended suction points and larger blower) – an estimated 6,000 pounds of TCE has been extracted and treated with granular activated carbon. A second VMS is under design by Fishbeck for a nearby building with fieldstone basement walls in poor condition.

Fishbeck has implemented high resolution site characterization (HRSC) to study a complex glacial depositional sequence with multiple saturated zones and chlorinated solvent-related contaminates migrating in differing directions. Fishbeck oversaw the collection of approximately 1,400 feet of MiHPT data to characterize the lateral/vertical extent of impact and guide future monitoring well installation. To-date, approximately 83 monitoring wells are associated with the subject investigation – all installed via hollow-stem auger or Rotosonic methods.

Given the extent of impact that has been identified, Fishbeck has collected indoor air and/or sub-slab soil gas samples from 10 buildings (nine off-site). The vapor intrusion pathway has also been further characterized by sampling contaminant vapors in sewer mains (storm and sanitary) across the study area as well as further evaluation in sanitary sewer traps/floor drains in three buildings.

The injection of zero valent iron (ZVI) via environmental fracturing was selected over traditional in situ injection approaches to achieve the target injectate volume, given the high contaminant mass, low formation permeability, and concern for back-diffusion. Fishbeck oversaw the injection of approximately 66,000 pounds of ZVI via 15 induced fractures within the source area. Pilot study activities have consisted of monitoring groundwater fluctuation with 25 data loggers and collection of primary and secondary compounds in groundwater and soil gas. Source-area TCE concentrations have decreased by approximately 75% in groundwater to-date, although monitoring is ongoing.

The following remedial technologies were utilized in this project:

- Indoor Air/Vapor Intrusion
- In-Situ Physical/Chemical Treatment
- Alternative Technologies/Post Remediation Strategies

Project 2 Reference Information:

Project Name: Former DTE Marysville Power Plant and Greenwood Oil Terminal
Key Personnels: Alisa Lindsay PE, Derrick Lingle CPG, and David Warwick
Project Address: 301 Gratiot Boulevard
Project City/State/Zip: Marysville, Michigan 48040
Owner/Client Contact Name and Telephone #: Geoff Donaldson, St. Clair County Metropolitan Planning Commission – 810.989.6950, gdonaldson@stclaircounty.org; Elizabeth Schlaeger, PE, EnviroAnalytics Group/Commercial Development Corporation – 314.307.1734, eschlaeger@enviroanalyticsgroup.com; Michelle Bakun, EGLE – 586.233.3408, bakunm@michigan.gov

Project 2 Description:
In 2013, the SCCBRA received an application for grant funding from CDC, the purchaser of the former DTE Marysville Power Plant, which was slated for demolition and redevelopment. CDC is a leading North American redevelopment firm specializing in the acquisition of contaminated industrial sites and their associated environmental liabilities. Envirologic's (now Fishbeck) role was to assess, evaluate, and obtain No Further Action (NFA) approval from EGLE for environmental issues related to the decommissioned power plant and the associated oil storage and distribution facility. This work was largely funded by the St. Clair County Brownfield Redevelopment Coalition, which obligated $329,250 of its U.S. EPA Assessment Grant for the sites.

Built in the 1920s, the 30-acre former power plant complex is prime waterfront real estate for revitalization. The 40-acre Greenwood Oil Terminal storage and distribution facility across the street was constructed in the late 1970s and was supported by a deep-water port located on the St. Clair River at the power plant complex. Although not currently operating, the terminal and deep-water port are still usable.

Site characterization data that had been identified through divestiture due diligence was evaluated, and then a comprehensive remedial investigation and action plan was developed; this plan was a condition of the property sale to CDC. Our team presented the plan to the seller, who accepted it; thereby, facilitating the property transaction. After the closing of the sale, the remedial investigation portion of the plan at both facilities was implemented and completed within 12 months. The investigation of both sites posed the following complex environmental challenges, among others:

- The proximity of the power plant to a major Great Lakes waterway (St. Clair River), with a creek that also traverses the property in two locations and empties into the river.
- The riverbanks were filled with unknown industrial debris and materials from surrounding industries in the area. Coal and coal ash storage, potential leaking underground storage tanks, ash slurry disposal, and oily waste basins were also concerns.
- The oil storage facility, which has over 15 million gallons of aboveground storage, sits on top of the former coal and coal ash storage area for the power plant. The creek extends onto the property and cuts through the former coal and coal ash storage areas. The oil storage infrastructure, combined with the previous storage of coal and coal ash, created a unique combination of contaminants in an environment not conducive to remediation.

The extensive multi-media investigation encompassing numerous potential exposure pathways. From these data, we prepared conceptual site models of both sites. Recommendations for mitigating potential exposure pathways through remedial action and/or administrative and engineering controls were also developed.

The power plant was demolished in November 2015. Response activities including soil excavation and filing of restrictive covenants to restrict resource and land use at the former power plant and Greenwood Oil Terminal properties. The restrictive covenants prohibited residential land uses, restricted groundwater use, identified the presence of soil above non-residential direct contract criteria, and included provisions for contaminated soil management. Five No Further Action (NFA) reports for non-residential closure were prepared and subsequently approved by EGLE for these properties, from 2016 to 2018.

To further expanded the redevelopment potential of this waterfront property, Envirologic also prepared a successful EGLE Grant proposal and application on behalf of the SCCBRA. This EGLE Brownfield Grant, awarded in 2020, supported additional site investigation and assessment of the former power plant property, which was necessary in order to pursue EGLE approval to allow for mixed-use residential and commercial redevelopment and determine future due care obligations for safe reuse. To facilitate redevelopment, the City of Marysville changed the property zoning to Planned Unit Development.

Of particular concern are the direct contact and volatilization to indoor air pathways. To address these concern, extensive soil sampling was conducted in March through May 2021 to comprehensively investigate the site for comparison to EGLE Part 201 Generic Residential Cleanup Criteria and Residential Volatilization to Indoor Air Pathway Screening Levels. Soil sampling included the use of incremental sample methodology (ISM) for shallow soils (representative sampling for defined soil volumes) and discrete sampling (collection of soil samples at greater depths). ISM sampling was performed for 75 decision units, encompassing 25 decision areas with three sample depth intervals each. Findings were reported to EGLE in November 2021. Based on investigation results, new and/or revised NFA report(s) were planned for submittal to EGLE to support reclassification of applicable portion(s) of the site from non-residential closure to unlimited or limited residential closures. Unfortunately, the property was purchased by a new owner in 2022, and there are no redevelopment plans in the foreseeable future.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Alternative Technologies/Post Remediation Strategies

Project 3 Reference Information:

Project Name: Lamont Street Fueling
Key Personnels: Alisa Lindsay PE and Zachary Curry
Project Address: 1226 Lamont Street
Project City/State/Zip: Kalamazoo, MI 49048
Owner/Client Contact Name and Telephone #: Eric McNamara, Kalamazoo County Government – 269.383.8954

Project 3 Description:

Kalamazoo County Buildings and Grounds Department contracted Envirologic (now Fishbeck) to manage underground storage tank (UST) removal and closure activities at their vehicle maintenance garage. Our team managed the UST closure activities, including LARA UST closure notification (30-day notice), field oversight of UST system removal (dispenser island, canopy, and USTs) and UST basin backfilling, site assessment, and release reporting. During UST system removal activities, we observed odors in soil and detected organic vapors with a photoionization detector (PID) below a former dispenser. We prepared a Confirmed Release (C-0213-19) with a September 24, 2019, release date.

Our team began the initial phase of investigation around the source areas with soil borings and installation of monitoring wells. Soil samples were collected in acetate macrocore liners, field-screened with a PID for organic vapors, and continuously characterized by a geologist. Oil-in-Soil® shake tests for light non-aqueous phase liquid (LNAPL) were also performed for some soil samples based on field observations. Discrete soil samples were collected for laboratory analysis of gasoline indicator parameters, including gasoline range organics. Permanent monitoring wells were installed with a Geoprobe®. Groundwater sampling was performed, using low-flow sampling protocol. Investigation-derived waste (IDW) was containerized in 55-gallon drums for off-site disposal at a licensed facility. The IDW drums were removed from the site by and transported to Dart Disposal and Recycling in Detroit, Michigan, for proper disposal. Our team prepared an initial assessment report, which was submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) within the statutory timeframe.

Based on the results from the initial assessment, the final assessment investigation included the installation of additional monitoring wells, in June 2020, to further delineate the vertical and downgradient extent of the groundwater contaminant plume. All soil borings were advanced using direct push technologies, to characterize the capillary fringe and saturated zone as a means to confirm proper placement of the screened interval. Soils were collected in acetate macrocore liners, field-screened with a PID for organic vapors, and continuously characterized by a geologist.

In order to assess the volatilization to indoor air pathway (VIAP) in accordance with EGLE's May 2013 Guidance Document for the Vapor Intrusion Pathway, as modified, 12 sub-slab vapor monitoring pins were also installed to evaluate the vapor intrusion pathway. Field monitoring was performed with a PID and 4-gas meter (oxygen, carbon dioxide, hydrogen sulfide, and % lower explosive level). Vapor samples were collected into Bottle Vac® containers. The samples were submitted for analysis of volatile organic compounds (VOCs), including naphthalene and 2-methylnapthalene, using EPA TO-15 (modified).

Site data has been compiled into a conceptual site model, and the extent of soil, groundwater, and LNAPL impacts have been fully delineated. The groundwater monitoring well network has been sampled quarterly to approximate the extent of groundwater contamination, assess concentration trends, seasonal fluctuations, and compare results to Part 213 Risk-Based Screening Levels and VIAP site-specific target levels issued by EGLE. The vapor monitoring pins have also been monitored quarterly, in accordance with EGLE guidance for Scenario 1: Source of vapors is confirmed to be adjacent to but not in contact or beneath a structure within the lateral inclusion zone. Exposure pathway risk assessment determined that exposure via ingestion of contaminated groundwater, inhalation of volatilized contaminants to indoor air, and exposure to potential residual LNAPL near the groundwater table are relevant. Groundwater monitoring indicates that the plume is stable, and vapor monitoring has demonstrated the there are no current VIAP risks.

A Restrictive Covenant was filed with Kalamazoo County Register of Deed in August 2022, and includes LNAPL notification, VIAP provisions, groundwater use restriction, and restriction of land use to non-residential only. An existing restrictive covenant will be rescinded upon closure approval by EGLE. The property is also subject to an

existing Kalamazoo County Sanitary Code groundwater use restriction ordinance. Notice to Local Units of Government of Land Use Restriction was sent to the Kalamazoo County Health and Community Service Department. The closure report was submitted to EGLE in January 2023 for approval of restricted non-residential closure under Part 213.

The following remedial technologies were utilized in this project:

- Excavation, Dewatering and Off-Site Disposal
- Demolition
- Indoor Air/Vapor Intrusion
- Alternative Technologies/Post Remediation Strategies

ARTICLE 3: REMEDIATION TECHNOLOGY EXPERIENCE

Include a brief description of your firm's professional experience in each of the following areas (as applicable to the technology):

3.1 Remedial Design:

Fishbeck has several environmental professionals that have completed ASTM Risk-Based Corrective Action (RBCA) training. We implement RBCA practices to determine the most effective way to investigation and address potential exposure pathways, considering project complexity, conceptual site model, chemicals of concern, and level of potential risk ot receptors. To reliably mitigation future potential risks, long-term remedial and corrective actions often include the filing of institutional controls with Registers of Deeds and local units of goverment, such as restrictive covenants, public highway institutional controls, MDOT Enviromnetal License Agreements, and/or special ordinances.

3.2 Construction Oversight:

Fishbeck maintains dedicated staff who routinely provide construction oversight services on remediation projects. These trained and experienced individuals handle all aspects of construction oversight with projects involving general site work, demolition, drilling, piping, trenching, excavation, and treatment systems. To ensure construction QA/QC is established, the following construction administration services are necessary and part of the construction phase services we provide:

- Attend preconstruction and progress meetings
- Site visits
- Coordinate onsite construction staking
- Monitor construction progress schedules
- Serve as a liaison with the contractor and assist in the understanding of the intent of the drawings and specifications
- Maintain engineer's set of site shop drawing records
- Observe general quality of the work, reject defective work, and oversee field sampling and testing requirements
- Maintain orderly files for correspondence, project meetings, shop drawings, samples, etc. at the project site
- Keep a daily log book recording contractor's hours onsite, weather conditions, work directives, visitors, daily activities, etc.
- Review contractor's pay applications
- Verify that certificates, test results, equipment, O&M manuals, etc., have been furnished by the contractor
- Prepare punch lists and coordinate their completion
- Conduct final inspections with owner and contractor

3.3 Remedial O&M:

Fishbeck has abundant experience preparing operation and O&M manuals for remediation systems and subsequent O&M activities. Our staff of professionals has extensive O&M experience in a variety of Ex-Situ Physical/Chemical Treatment remedial designs including, but not limited to, air stripping, GAC, pump and treat systems, advanced oxidation, and catalytic oxidation.

Amongst its Environmental Services Division and the Key Personnel for this proposal, Fishbeck staff hold the following certifications:

- Michigan Class A, B, C, and D Wastewater Certifications
- Michigan Industrial and Commercial Wastewater Operator Certifications
- EGLE Waste Treatment Plant Operator Classifications A-2b, A-2d, A-1f, B-2c, B-3b and C-3b

Remedial O&M activities are also described in the Project Summaries.

3.4 Site Closure:

Fishbeck has been responsible for numerous site closures throughout the history of the firm, many of which included preparation and filing of of various institutional controls as part of a comprehensive closure strategy. Overall closure strategies are unique to each site and consider several remedial options and alternative to determine the most effective and efficient solution for a given site. We have abundant experience with site closure requirements, as defined under Section 21312a, Part 213 Leaking Underground Storage Tanks, of NREPA, 1994 PA 451, as amended. Fishbeck has also been responsible for achieving site closures and no further actions for Part 201 sites, as defined under Section 20114d, Part 201 Environmental Remediation, of NREPA, 1994 PA 451, as amended.

For detailed information, see Project Summaries.

3.5 Soil Erosion and Sedimentation Control:

Fishbeck has extensive experience in developing, permitting, administering, and inspecting SESC plans for sites; however, this is generally not applicable to this technology.

ARTICLE 4: PERSONNEL STAFFING

4.1 An organizational chart that includes each person on your project team and their identified roles for a typical assigned project utilizing this technology is provided? ☒Yes ☐No

4.2 Please fill out the following information regarding the personnel your firm considers key to the successful completion of project utilizing this technology

Key Personnel 1

Name: Alisa Lindsay, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): BS in Civil and Environmental Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 2

Name: Kerri Miller, PE, LEED AP Job Title: Senior Vice President/Principal
Labor Classification: P4 College Degree(s): BS in Civil Engineering, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 3

Name: Peter Lepczyk, CPG Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Geology, Hope College
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 4

Name: David Warwick Job Title: Vice President/Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Geology/Emphasis on Hydrogeology, Western Michigan University; BS in Geology, Eastern Kentucky University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 5

Name: Chad Weber, PE Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering and BS in Civil Engineering, University of Michigan
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 6

Name: Mike Apgar Job Title: Senior Environmental Engineer
Labor Classification: P4 College Degree(s): MS in Environmental Engineering, Michigan State University; Secondary Education Certification and Chemistry Minor, Western Michigan University; BS in Science/Biology, University of Michigan Flint
Successfully completed 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 7

Name: Chris Carew Job Title: Senior Geologist
Labor Classification: P3 College Degree(s): BS in Geology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 8

Name: Rick Dunkin, CPG, LPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): MBA in Finance, Walsh College; MS in Geology, University of Toledo; BA in Geology/Environmental Studies, Susquehanna University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 9

Name: Paul French Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): BS in Geology, Murray State University; Graduate Certificate in Applied Hydrogeology, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 10

Name: Bruce Gillett, CPG Job Title: Senior Hydrogeologist
Labor Classification: P4 College Degree(s): MS in Hydrogeology, Wright State University; BS in Earth Science Education, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 11

Name: Derrick Lingle, CPG Job Title: Senior Hydrogeologist
Labor Classification: P3 College Degree(s): MS in Geology, Western Michigan University; BS in Environmental Geoscience, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 12

Name: Jess Watterson Job Title: Senior Environmental Scientist
Labor Classification: P4 College Degree(s): BS in Environmental Science, Grand Valley State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 13

Name: Todd Campbell, CPG Job Title: Senior Geologist
Labor Classification: P4 College Degree(s): BS in Geophysics, Western Michigan University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 14

Name: Zachary Curry Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology, Grand Valley State University; Precambrian Research Field Camp, University of Minnesota-Duluth
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 15

Name: Bailey Hannah Job Title: Hydrogeologist
Labor Classification: P2 College Degree(s): MS in Environmental Geosciences, Michigan State University; BS in Environmental Science and Sustainability, Michigan State University
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

Key Personnel 16
Name: Kayla Rooney Job Title: Geologist
Labor Classification: P2 College Degree(s): BS in Geology/Environmental Emphasis, Grand Valley State University; Hydrogeology Field Course, Western Michigan University; BA in Photography, Kendall College of Art & Design
Successfully completed 40 hour HAZWOPER training with an up-to-date 8 hour HAZWOPER refresher training? ☒Yes ☐No

4.3 Do all the Professional Project Manager (PM) have at least three years experience as a PM? ☒Yes ☐No

4.4 Do all Professional PM have a minimum of 10 years experience with similar projects? ☐Yes ☒No

4.5 Resumes for the key personnel provided? ☒Yes ☐No

ARTICLE 5: SUB-CONSULTANTS/SUBCONTRACTORS

Fishbeck is not proposing to use any professional subcontractors.

5.1 Specifically, identify any sub-consultants/subcontractors you plan to use for the successful completion of a project utilizing this technology *(Note: If any support must be provided by a sub-consultant/subcontractor, said sub-consultants/subcontractors must indicate their capability and willingness to carry out the work)*:

Sub-Consultant/Subcontractor 1

Business Name: N/A
Address:_____
City/State/Zip:_____

Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 2

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

Sub-Consultant/Subcontractor 3

Business Name: N/A
Address:_____
City/State/Zip:_____
Contact Name and Telephone #:_____
Description of Work to Be Conducted:_____
Letter of intent provided? ☐Yes ☐No

5.2 Are sub-consultants/subcontractors trained in health and safety procedures, including participating in a medical monitoring program, and comply with 29 CFR Part 1910, as amended? ☐Yes ☐No

5.3 If a sub-consultant/subcontractor is to be used for drilling, do they have a minimum of 5 years related experience? ☐Yes ☐No

5.4 Provide the following information and brief descriptions of at least three (3) projects in the last five years closely related to the work associated with this technology for each sub-consultant/subcontractor:

Project 1 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 1 Description:_____

Project 2 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 2 Description:_____

Project 3 Reference Information:

Project Name: N/A
Key Personnels:_____
Project Address:_____
Project City/State/Zip:_____
Owner/Client Contact Name and Telephone #:_____
Project 3 Description:_____

ARTICLE 6: SPECIAL FACTORS

Include a brief description of your firm's special qualifications such as awards, recognitions, innovations, etc. pertaining to this technology.

Fishbeck provides innovative technical solutions for projects involving remedial investigation, active remediation, hazardous condition abatement, risk mitigation of potential exposures to human health and/or the environment, and site closure. We consider ourselves to be innovative and our projects demonstrate this aspect of us. We invest significantly in training, professional development, and research to be knowledgeable and experienced in the state of the industry for innovative technology applications.

Fishbeck has several environmental professionals that have completed ASTM Risk-Based Corrective Action (RBCA) training. We implement RBCA practices to determine the most effective way to investigation and address potential exposure pathways, considering project complexity, conceptual site model, chemicals of concern, and level of potential risk to receptors. To reliably mitigation future potential risks, long-term remedial and corrective actions often include the filing of institutional controls with Registers of Deeds and local units of government, such as restrictive covenants, public highway institutional controls, MDOT Environmental License Agreements, and/or special ordinances. Fishbeck has extensive experience with the preparation and filing of various institutional controls as part of a closure strategy.

Many circumstances arise during the completion of environmental/remediation projects that require the assistance of various experts and specialists. Fishbeck's environmental services division is fortunate to be supported by other in-house experts. The other areas of expertise include:

- Professional surveyors
- Licensed drone operator
- Global Information System specialists
- Civil engineers
- Mechanical engineers
- Electrical engineers
- Regulatory program specialists
- Structural engineers
- Industrial hygienists, including certified industrial hygienists
- Wetlands/Ecological/Threatened and endangered species specialists
- Construction estimators
- Construction managers
- Financial specialist
- GIS specialists

Fishbeck has, and currently holds, ISID contracts for environmental, architectural, and civil engineering projects. We are familiar with the associated contracting and project management processes and are excited by the prospect of providing additional environmental services to the MDTMB and other lead state agencies.

Other special factors include our belief that delivery of high-quality service on schedule and within budget is based on good preparation and effective communication. We value effective open communication with our clients, so that we understand our client's need and objectives and best determine how effectively formulate and implement a plan to meet their objectives and while meeting regulatory requirements. Appropriate resources are always available to our staff to efficiently execute MDTMB project assignments.

2023 ISID Expanded Environmental Remediation Experience Summary

Remediation Technology: *Alternative Technologies/Post Remediation Strategies*

Professional's Name: *Fishbeck*

Components/Technics: (check all that apply) ☐ Micro and Nanotechnologies ☒ Engineering Controls ☒ Institutional Controls ☒ Alternative Land Reuse ☒ Remediation Process Optimization ☒ Subsurface Imaging Technologies ☒ Risk Management ☐ Drones/Robots/Artificial Intelligence (AI)/Satellites for Monitoring of Remediation Systems ☐ Others

	Professional	MI Office(s)	Sub-Consultants
1. Number of projects applying this Technology in the past ten (10) years:			
Designed	>50	>50	0
Construction Oversight	5	5	0
O & M	>50	>50	0
Closed	>10	>10	0
Used Treatment Train	5	5	0
2. Range of cost per project:			
Design Phase	$10k-$50k	$10k-$50k	0
Construction Phase	$1k-$50k	$1k-$50k	0
O & M Phase	$5k-$250k	$5k-$250k	0
Total Project Cost	$1k-$300k	$1k-$300k	0
3. Number of the above projects that were:			
Below Budget	0	0	0
On Budget	>50	>50	0
Over Budget*	1	1	0
4. Number of staff with more than five (5) years of experience in this technology:			
Licensed Environmental Engineers	2	2	0
Licensed Civil Engineers	3	3	0
Licensed Chemical Engineers	0	0	0
Geologists	8	8	0
Hydrogeologists	8	8	0
Licensed Surveyors	2	2	0
Licensed Electrical Engineers	0	0	0
Licensed Mechanical Engineers	0	0	0
Environmental Science	3	3	0
Biologists	2	2	0

*Provide explanation, including strategies implemented to fix the issue:

Due to the number of staff employed and the number of projects completed by Fishbeck, it is difficult to provide exact numbers on the exact financial outcomes and number of projects. Fishbeck engages in frequent communication with our clients to ensure they are kept informed of the impact of scope of work changes (typically initiated by the client) and discovery of previously unknow conditions. These issues are the most significant factors impacting project budget and schedule. When projects do exceed originally approved budgets, Fishbeck strives to identify the overages early in the process to allow budget saving scope adjustments or revision of project details to offset cost overages.

Appendix

ALISA LINDSAY, PE

SENIOR ENVIRONMENTAL ENGINEER

YEARS OF EXPERIENCE

3 years — Fishbeck
25 years — total

EDUCATION

BS in Civil and Environmental Engineering, University of Michigan, 1997

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer – Michigan

EGLE Storm Water Management – Construction Sites (A-1j)

EGLE Waste Treatment Plant Operator – Industrial and Commercial, A-2b, B-2c, B-3b

HAZWOPER Site Worker

TRAINING

Great Lakes PFAS Summit

Integration of Resiliency and Sustainability into Remedy Evaluation, Design, and O&M

ITRC Petroleum Vapor Intrusion Workshop

ASTM Risk-Based Corrective Action Applied at Petroleum Release Sites

State of Michigan Quality of Life Leadership Academy

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Senior Environmental Engineer
Envirologic Technologies, Inc.	2020–2023	Project Manager/Senior Environmental Engineer
Michigan Department of Environment, Great Lakes, and Energy (EGLE) – Remediation and Redevelopment Division (RRD)	2016–2020	Licensed Professional Environmental Engineer
	2017	Acting District Supervisor
	2015–2016	Senior Environmental Quality Analyst
	2014–2015	Environmental Quality Analyst
D. C. Cook Nuclear Plant	2010–2014	Production Engineering Supervisor and Engineering Outage Manager
	2009–2010	Engineering Forced Outage Manager
	2008–2009	Civil Engineer, Production Engineering
DLZ Michigan, Inc.	2005–2008	Project Manager
	1998–2005	Project Engineer
Plastomer Corporation	1997–1998	QA/QC Laboratory Supervisor

PROFESSIONAL SUMMARY

Alisa is a senior environmental engineer and team leader with Fishbeck. In this capacity, she provides engineering and technical support to the Environmental Service Division; workload, personnel, and resource management for her technical team; and prepares project proposals. She also the ISID Environmental Contract Manager and has developed a strong rapport with MDTMB, as well as many EGLE project managers and administrative support staff. She has been the project manager for several ISID projects, including the 213 Closure Pilot project, which entails 15 sites. She has successfully managed five ISID projects to project closeout under the 2019 ISID Environmental contract, working with the EGLE project managers to define and execute the scope of work to meet project objectives while maintaining project budget. She also manages complex site investigations and compliance projects and works on investigation and closure strategies with other project managers. She managed and designed the site investigation for the Former DTE Marysville Power Plant, to determine if the site could be reclassified through additional site characterization and new institutional controls to allow for mixed-use redevelopment. She prepares technical documents, such as work plans, project status reports, final assessment reports, and closure reports, for a variety of compliance sites, and is familiar with the preparation of various institutional controls. She also assists with the preparation and review of vapor intrusion mitigation system designs.

Alisa has expertise in Part 213 Leaking Underground Storage Tanks (USTs), and Part 201 Environmental Remediation of the Natural Resource and Environmental Protection Act (NREPA), 1994 PA 451, as amended. She also provides technical support for work under Part 215 Underground Storage Tank Corrective Action Funding of NREPA and Brownfield Redevelopment Financing Act of 381 of 1996. While with EGLE, Alisa managed all of the Part 213 leaking sites in Kalamazoo and Van Buren Counties and was responsible for regulatory oversight and submittal audits. She also scoped and oversaw the investigation of over 45 sites under EGLE's Statewide Expanded Triage Program. She was also on the Engineering and Contract Assistance team, providing engineering and specification review support to EGLE-RRD staff, and the Incremental Sampling Methodology Technical and Program Support Team, where she provided technical review of EGLE's ISM resource document, trained staff, and supported EGLE staff with data quality objective development and sampling design.

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ALISA LINDSAY, PE

SENIOR ENVIRONMENTAL ENGINEER

TRAINING (CONTINUED)

PSMJ Project Management Bootcamp I and PM Best Practices Implementation

Sanitary Landfill Design, University of Wisconsin – Madison

While at D.C. Cook Nuclear Plant, Alisa provided structural and civil engineering design to solve emergent issues and component-level repairs. When the plant experienced an unprecedented turbine failure, she was the engineering forced outage manager, responsible for coordinating, facilitating, and scheduling engineering support. She also designed unique lifting and support tools and developed lifting and rigging plans. She gained significant troubleshooting and team coordination experience by leading and training failure investigation process teams, which involved all departments to ensure safe, efficient, and effective recovery of emergent plant issues. As production engineering supervisor, she managed and provide QA/QC for a large multi-disciplinary group of engineers and scientists to support the day-to-day activities and emergent issues.

Alisa gained environmental consulting experience while at DLZ Michigan, Inc. Some key projects included the Spartan Chemical Company Superfund Site, for which Alisa was on the site investigation team, design and conducted soil vapor extraction (SVE) pilot testing, reviewed surfactant injection pilot test design, prepared the feasibility study, assisted with design of the SVE system and *ex-situ* vapor stream treatment, performed construction oversight, wrote the SVE O&M manual, performed system optimization, and provided SVE system training. She was the certified operator and project manager for pump and treat systems at the Crystal Refinery site in Carson City, Michigan and Cass Street site in Edwardsburg, Michigan (dry cleaner release). She also worked on a U.S. Army Corp of Engineers biopiles study for two facilities in Wisconsin, collecting and analyzing biopile monitoring data for attenuation trends and biopile optimization. She also gained significant demolition experience, including the preparation of bid specifications, contractor coordination, and/or oversight, including the Kalamazoo Tank and Silo site and EGLE's Detroit Multi-Site Demolition project. Alisa was the lead engineer for sediment remediation design for the former Whitehall Leather Company site In Whitehall, Michigan and managed sediment remediation for the Chemical Tar Pit site in Jennings, Michigan.

At Plastomer Corporation, which produces polyurethane foam and adhesives for the automotive industry, Alisa developed standard operating procedures, trained and supervised laboratory technicians, conducted polyurethane foam and adhesive testing, worked with the production and delivery departments, and lead the laboratory through successful ISO auditing.

EXPERIENCE

- Management and engineering experience in state government, environmental consulting, nuclear energy, and the automotive industry.
- Provides engineering review and consultation support to EGLE Remediation and Redevelopment Division personnel.
- Performs technical reviews ranging from proposals and sampling plans to construction specifications and institutional controls.
- Managed EGLE's ISID 2019 and 2023 Environmental Services contracts for Fishbeck, and managed select ISID projects
- Develops and review specifications and bid documents (construction, performance, and demolition), status reports, pilot tests, remedial investigations, feasibility studies, remedial action plans, initial assessment reports, final assessment reports, closure reports, no further action reports, health and safety plans, SWP3, SPCC/PIPP, integrated contingency plans, data quality objectives, sampling and analysis plans, and Phase I and II ESAs, BEAs, and documentation of due care compliance.
- Designs treatment systems and remedial actions for sediment, soil, and groundwater remediation.
- Performs contractor oversight and project management.
- Oversees and performs treatment system operation and maintenance.
- Provides technical expertise for the use of incremental sampling methodology.
- Oversaw and managed all leaking UST sites in Kalamazoo and Van Buren Counties

ALISA LINDSAY, PE

SENIOR ENVIRONMENTAL ENGINEER

regulated under Part 213.

- Investigated over 45 properties through the Part 213 Statewide Expanded Triage program.
- Reviewed Brownfield Plans and provided technical support to Brownfield coordinators.

PRESENTATIONS/PUBLICATIONS

Co-presenter, Incremental Sampling for Small to Large Scale Brownfield Assessment Projects, 2023 National Brownfields Training Conference,2023 (future)

Presenter, Incremental Sampling Methodology to Support Land Use Site Reclassification, American Institute of Professional Geologists – Michigan Section, 2023

Co-presenter, Incremental Sampling Methodology – Evaluating Risk by Design: The Importance of Representative Sampling for Managing Environmental Risk, Michigan Environmental Compliance Conference, 2016; and 6th Annual AIPG Michigan Technical Workshop, 2016.

Co-presenter, Schipper's Crossing – Case Study: Incremental Sampling for a Former Small Arms Practice Range, Environmental Remediation and Risk Management Conference, 2015.

Keynote Speaker, Feasibility Studies Development, Environmental Remediation Equipment Seminar, 2005

Lead author and presenter, Overview of Sediment Remediation of Tannery Waste Contamination in Tannery Bay, White Lake, Michigan, 20th Annual International Conference on Contaminated Soil, Sediment and Water, 2004

Co-author, Unlimited Industrial Closure of Detroit Artillery Armory Using the State of Michigan's "Sampling Strategies and Statistics Procedures," 20th Annual International Conference on Contaminated Soil, Sediment and Water, 2004.

KERRI MILLER, PE, LEED AP

SENIOR VICE PRESIDENT | PRINCIPAL

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2000–present	Senior Vice President | Principal
Earth Tech	1999–2000	Civil Engineer
CTE Engineers	1998–1999	Civil Engineer

PROFESSIONAL SUMMARY

After starting as a civil engineer, Kerri has been instrumental to the growth and development of Fishbeck as one of ENR's Top 300 Engineering and Design Firms in the nation. Kerri's experience includes building site designs, utility master planning, stormwater planning, road and parking lot design, utility design, and sustainability planning. She has managed large site projects, major developments, and the infrastructure needs for numerous types of clients.

Becoming a Principal in 2014, Kerri leads the firm's Business Development Committee, strategic direction, and market growth. In 2016, Kerri was named one of the 50 Most Influential Women in Grand Rapids by GRBJ and a Tribute Award winner by the YWCA West Central Michigan.

EXPERIENCE

- Oversees all Environmental Department staff as the Principal-in-Charge.
- Performs quality assurance/quality control reviews.
- Provides firm oversight ensuring projects are delivered to the highest standards.
- Over 25 years' experience in civil engineering and site design, including site utilities, grading plans, stormwater management plans, permits, LEED documentation, construction administration.
- Worked to include sustainable site plans and features, such as rain gardens, green roof surfaces, porous concrete sidewalks, porous asphalt parking lots, native plantings, swales, and underground retention within storm sewer pipes.
- Created stormwater master plans, including analysis of systems and hydraulic modeling, evaluations of potential improvements, and recommendations of alternatives.
- Design of new stormwater drainage systems, which included evaluating design alternatives and concepts, stormwater sizing and layout, reestablishing existing slope failures, coordinating with EGLE and clients, preparation of contract documents, and construction oversight.
- Streetscape design including sidewalks, street lighting, landscaping, and irrigation. Required coordination with MDOT and local authorities.
- Completed several USDA Rural Development funded projects that included water main replacements, site layouts for well houses and elevated storage tanks, sanitary sewers, pump houses, and force mains.
- LEED consulting and third-party reviews.

YEARS OF EXPERIENCE

23 years — Fishbeck
25 years — total

EDUCATION

BS in Civil Engineering,
Michigan State University, 1997

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer – Michigan

LEED Accredited Professional

MEMBERSHIPS

American Society of Civil Engineers

Society of American Military Engineers

Society for College and University Planning

International Council of Shopping Centers

US Green Building Council/ West Michigan Chapter

fishbeck

PETER LEPCZYK, CPG

VICE PRESIDENT | SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2010–present	Senior Hydrogeologist
Global Remediation Technologies, Inc.	2001–2010	Hydrogeologist

PROFESSIONAL SUMMARY

Peter is a senior hydrogeologist and geosciences/remediation department director for Fishbeck. Peter has 23 years of relevant experience working in environmental consulting throughout Michigan and the United States. In his capacity as department director, he is in charge of the overall management of the department and team leaders. His primary responsibilities include optimizing utilization of department staff, staffing, ensuring technical competency and knowledge of personnel, quality assurance/quality control, monitoring financial performance, pursuit of project opportunities, reviewing contracts, and communication. In his capacity as senior hydrogeologist, he focuses on hydrogeological and remedial investigations, design of conceptual site models, feasibility studies, groundwater flow and fate and transport models, and remedial designs. Since 2021, Peter has overseen Fishbeck's portfolio of twelve significant environmental projects for an industrial client with legacy sites across the United States. He actively manages four of them (two in California, one in Michigan, and one in Virginia).

Beginning in 2010, Peter worked as a senior hydrogeologist managing projects primarily in the industrial sector as well as for Michigan Department of Transportation (MDOT). He has managed projects impacted with a variety of compounds of concern under state authority, RCRA, and CERCLA. In this capacity, he designed remedial investigations to characterize the nature and extent of various contaminants of concern (e.g., chlorinated solvents, non-aqueous phase liquids, metals, volatile and semi-volatile organic compounds, polychlorinated biphenyls, cyanide, per- and polyfluoroalkyl substances, etc.) in all environmental media (e.g., soil, sediment, groundwater, vapor, surface water). Once the nature and extent of impacts were understood, he developed cleanup strategies and designs, including various *in-situ* techniques (e.g., enhanced reductive dechlorination, *in-situ* chemical treatments, etc.), excavations, and *ex-situ* treatments. In this role, he has served as the project manager for the 76 Getty Street site in Muskegon, responsible for the management and implementation of various investigations, an ERD treatment system, SVE treatment system, construction of exposure barriers, excavations, and placement of restrictions.

From 2001 through 2010, Peter worked as a hydrogeologist. In this role, he attained an abundance of experience in the environmental field, office, and laboratory, including project management, budget tracking, work plan preparation, conducting remedial investigations, analyzing and interpreting environmental data, conducting and analyzing aquifer tests, directing day to day field activities, supporting remedial designs and implementations, and authoring various client and regulatory reports. While in this capacity, he worked on several projects on behalf of EGLE through various MDTMB contracts. Most notably, served as the principal investigator for the Belgravia site in South Haven which involved extensive investigation of TCE, heavy metal, arsenic, cyanide, and PAH contamination in a glacial till using, what were at the time, innovative field screening and drilling techniques (i.e., rotosonic drilling with multiple casings, UV fluorescence, Sudan IV) for identification of DNAPL. He was a contributor to the feasibility study which recommended thermal remediation. While in this capacity, he also supported the U.S. EPA's Superfund Technical Assessment and Response Team (START) contract and participated in several large investigations and cleanups, including the Former Grand Traverse Overall Project, tannery sites in the Upper Peninsula of Michigan, and the Enbridge Oil Spill in Marshall.

YEARS OF EXPERIENCE

12 years — Fishbeck
23 years — total

EDUCATION

MS in Environmental Geosciences, Michigan State University, 2005

BS in Geology, Hope College, 1997

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist – American Institute of Professional Geologists

HAZWOPER Site Worker, Site Manager, and Supervisor Training

Confined Space Entry Training

FEMA ICS-100 Introduction to Incident Command System (ICS)

FEMA ICS-200 ICS for Single Resources and Initial Action Incidents

MEMBERSHIPS

American Institute of Professional Geologists

National Groundwater Association

TRAINING

EGLE – Environmental Remediation and Risk Management Conference, 2015

fishbeck

PETER LEPCZYK, CPG

VICE PRESIDENT | SENIOR HYDROGEOLOGIST

TRAINING (CONTINUED)

Using Degradation Rate Constants to Select the Most Efficacious Remedial Approach – Monitored Natural Attenuation, Biostimulation, and/or Bioaugmentation, 2014

AIPG Light Nonaqueous Phase Liquids Work Shop, 2012

Vapor Intrusion Training, Interstate Technology & Regulatory Council

EGLE-RD Workshop for the December 2010 Amendments to Part 201, 2011

Vapor Intrusion Pathway Training, 2011

Project Management Boot Camp, 2010

Improving the Description and Characterization of Glacial Successions, 2008

EGLE-RRD Cleanup Criteria Training, 2007

Risk-Based Corrective Action at Petroleum Release Sites, 2007

Glacial Geology of the Leelanau Peninsula, Michigan, 2007

Glacial Geology of Michigan: New Insights and Interpretations, 2007

Spill of National Significance Exercise, 2007

Incident Command System Training (ICS100, ICS200), 2007

Michigan Manufacturers' Guide to Environmental, Health, and Safety Regulations, 2006

EXPERIENCE

- Oversees Fishbeck's portfolio of twelve significant environmental projects managed for an industrial client with legacy sites across the United States. Actively manages four of the projects in California, Michigan, and Virginia involving investigations and remedial activities of various environmental media and contaminants of concern.
- Manages MDOT's Preliminary Site Investigation program for Fishbeck.
- Performed traditional characterization methods, including drilling with direct push, hollow-stem auger, rotary, and roto-sonic drilling techniques; groundwater sampling with push ahead; drop screen; and temporary wells using various sample collection methods.
- Performed high-resolution site characterization techniques using a membrane interface, hydraulic profiling tool (MiHPT), and laser-induced fluorescence.
- Utilized advanced laboratory techniques to evaluate remediation performance and fate and transport of chemicals (e.g., compound specific isotope analysis, biological testing, magnetite analysis, etc.).
- Developed conceptual site models to convey nature and extent of contamination, transport mechanisms, remedial progress, and receptors pictorially and through written text.
- Designed and implemented remedial actions, including excavations, soil capping, air sparging, soil vapor extraction, groundwater extraction and treatment, enhanced reductive dechlorination, monitored natural attenuation, *in-situ* chemical oxidation, and *in-situ* chemical reduction.
- Prepared analytical and numerical groundwater and chemical reactive fate and transport models.
- Authored and performed reviews of technical work (e.g., proposals, reports, presentations, and analysis).

PUBLICATIONS/PRESENTATIONS

Lepczyk, P., Weber, C., and Colvin, M., "High-Resolution Characterization of a Source Area and its Downgradient Plume to Optimize Full-Scale ERD Design" Poster presentation at the Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, California May 25, 2022.

Lepczyk, P., and Weber, C, "A Novel Approach to Characterize a Chlorinated Solvent Plume Beneath an Extensive Wetland System," Platform presentation at the Michigan AIPG 10th Annual Environmental Risk Management Workshop, June 16, 2021.

Lepczyk, P., Greene, D., Colvin, M., and Murphy, P., "Demonstration of Natural Attenuation of Chlorinated Ethenes through the Use of an Improved Conceptual Site Model, Compound-Specific Isotope Analysis, and Magnetic Susceptibility, " Platform presentation at the 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, Florida, May 19, 2015.

Lepczyk, P., Colvin, M., Apgar, M. and Bertaut, A., A Full-Scale Biotreatability Study at Former Teledyne Semiconductor/ Spectra Physics Superfund Site in Mountain View, California, Poster presentation at the 9th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California May 20, 2014.

Lepczyk, P., Posavatz, N., and Prall, W., "Geochemical, Modeling, and Bench Study Testing of Nickel-Contaminated Groundwater Treatment Alternatives," Poster presentation at the 7th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California May 24, 2010.

Peterson, J.W., Lepczyk, P.A., and Lake, K.L., 1999, "Effect of Sediment Size on Area of Influence During Ground Water Remediation by Air Sparging: A Laboratory Approach," Environmental Geology, v. 38, n 1, p.1-6.

PETER LEPCZYK, CPG

VICE PRESIDENT | SENIOR HYDROGEOLOGIST

TRAINING (CONTINUED)

Groundwater Flow and Transport Modeling with GMS, 2003

Sampling Strategies & Statistical Applications for Compliance with Part 201 Cleanup Criteria, 2002

AWARDS

Client Focus, Teamwork, and Exceptional Quality in Providing Time-critical Support to the USEPA, Weston Solutions, 2008

Excellence in Teaching Award, Michigan State University, Geology Department, 2001

Warren W. Wood Fellowship (student research in hydrology), Michigan State University, Geology Department, 1999

General Motors Environmental Excellence Award Scholarship, Hope College, 1997

Tulip City Gem and Mineral Club Award, Hope College, 1997

Sigma Xi Research Award, Hope College, 1997

Hope College Geology Department Book Award, 1996

DAVID WARWICK

VICE PRESIDENT/SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Vice President/Senior Hydrogeologist
Envirologic Technologies, Inc.	1989–2023	President/Senior Geologist
Technical Services Associates, Inc.	1986–1989	Geologist

PROFESSIONAL SUMMARY

David is a senior hydrogeologist and advisor with Fishbeck. In this capacity he manages various remedial investigation/remediation projects for industrial, agribusiness, and petroleum clients. He also acts as a project strategist for various other projects to assist colleagues and clients develop sound remedies to clean up sites of environmental contamination. He advises colleagues on technical communications and project management skills.

For 33 years David was a project manager, senior hydrogeologist, and co-owner of Envirologic Technologies, Inc., until its purchase by Fishbeck in 2023. Amongst his business responsibilities, he managed a portfolio of Part 213 sites from initial tank removal, and remedial investigations to closure. He meets the definition of a Qualified Underground Storage Tank professional. In addition to Part 213 sites, he managed and brought to closure numerous industrial sites of contamination regulated under Part 201, including specialties in heavy manufacturing consisting of iron foundries, OEM Automotive (chemical releases), and power plant decommissioning and closure. He developed and had approved numerous Quality Assurance Project Plans for various Brownfield redevelopment projects throughout Michigan. He also managed due care investigations to support redevelopment projects. As a component of remedial investigations, he implemented incremental sampling method protocols to evaluate exposure to sites of contamination as part of site closure documentation.

David has extensive experience with assisting clients achieve and maintain compliance with environmental rules and regulations. He performed numerous environmental compliance reviews of myriad of manufacturing entities including development and implementation of compliance plans (PIPP, SPCC, SWPPP, ICP). He developed air use permit to install applications for various industrial processes including natural gas compression/distribution, foundry, coating operations, and FRP products. He developed and implemented record keeping systems for various permits.

As a geologist with Technical Service Associates, he performed various compliance audits for the foundry industry as well as other related manufacturing. He provided air emission testing services to support air use permit applications and permit conditions. He became proficient with air quality dispersion modeling to support air use permit applications. He also developed and implemented remedial investigations of industrial process releases including general manufacturing, plating, iron foundry, etc.

EXPERIENCE

- Prepared remedial investigations and risk assessment protocols applied to varying contaminant situations including organics, metals, and PCBs; design and implement groundwater monitoring systems at industrial facilities and solid waste disposal areas to monitor site activities and/or investigate alleged contamination.
- Experience with Part 111 and 115 waste characterization and disposal, and RCRA Part B permit closures and closure assessments.
- Prepared hydrogeologic characterization of prospective landfill sites and groundwater monitoring at landfills.

YEARS OF EXPERIENCE

33 years — Fishbeck
37 years — total

EDUCATION

MS in Geology/
Emphasis on Hydrogeology,
Western Michigan University,
1985

BS in Geology,
Eastern Kentucky University, 1983

REGISTRATIONS/ CERTIFICATIONS

HAZWOPER Site Worker

Vapor Barrier Inspector,
Certified Land Science
Technologies, Inc.

MEMBERSHIPS

National Ground
Water Association

Michigan Association of
Environmental Professionals

Air & Waste Management
Association

American Institute
of Professional Geologists

fishbeck

DAVID WARWICK

VICE PRESIDENT/SENIOR HYDROGEOLOGIST

- Performed Part 201 design and remedial investigation implementation, feasibility studies, response activity plans, remedial action plans, and generic and restricted residential and non-residential no further action designations.
- Completed vapor intrusion assessments and mitigation system design and operation.
- Prepared incremental sampling methodology work plan design and implementation.
- Developed and implement quality management plans.
- Developed and implement QAPPs to support USEPA-funded Brownfield assessment grants.
- Conducted Part 213 leaking UST investigations, remedial activities, and compliance report preparation.
- Performed ESAs and due diligence activities to establish property conditions for real estate transactions.
- Designed and implemented sampling programs for determining characteristics of solid waste for appropriate waste designation.
- Prepared groundwater/surface water discharge permit applications, air use permit applications, monitoring reports, and continued compliance reports (PIPP, SPCC).
- Completed environmental compliance audits to establish compliance status of industrial/commercial facilities with environmental regulations.
- Prepared statistical analyses of groundwater data and environmental quality data.
- Conducted State of Michigan air use permits to install developmental and compliance record keeping and applied and implemented Rule 290 record keeping to industrial and remediation processes.

PRESENTATIONS/PUBLICATIONS

Warwick, D. B. and Lingle, D. A.; Remedial investigation and remediation of the former Marysville Power Plant complex. AIPG Michigan Section Technical Workshop, Roscommon, Michigan, June 13, 2017.

CHAD WEBER, PE

SENIOR ENVIRONMENTAL ENGINEER

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2018–present	Senior Environmental Engineer
Global Remediation Technologies	2016–2018	Project Manager/Senior Engineer
ERM	1994–2016	Senior Consultant/Project Manager

PROFESSIONAL SUMMARY

Chad is a senior environmental engineer with Fishbeck and has 29 years of experience working on environmental assessment, remediation, and redevelopment projects throughout the United States and Australia for both private and government clients. He has expertise with Michigan's environmental regulations (e.g., Part 201, 213, 111), due care compliance evaluations, vapor intrusion assessment and mitigation, remedial design/construction, feasibility studies, operation and maintenance of remediation systems, decontamination/demolition, and management of risks posed by contamination encountered on construction/excavation projects.

In his current position, Chad provides engineering and technical support to Fishbeck's Environmental Service Division, performs remediation system design, and prepares project proposals. Chad currently manages response activities at a number of industrial sites, often working closely with EGLE project managers in the Part 201 program. He recently performed design and implementation of an enhanced reductive dechlorination/zero valent iron (EZVI) approach to treat a chlorinated solvent plume; the project also involved RCRA permitting and inspection/maintenance of a waste pile cap to comply with permit requirements. Chad has designed numerous passive and active (sub-slab/sub-membrane depressurization) mitigation systems to address vapor intrusion risks at residential and commercial/industrial buildings, often with design review and approval performed by EGLE. Chad has prepared work plans for and implemented the incremental sampling methodology (ISM) approach to characterize exposure risks and determine disposal options for contaminated soils. At a multi-faceted RCRA remediation project in Muskegon, Chad performed design, bidding, construction oversight, and O&M for a soil vapor extraction system; designed two large exposure barriers for capping of PCB-contaminated soils; and coordinated the approval of an Environmental License Agreement for contaminated media remaining in an MDOT right-of-way.

With GRT, Chad was the project manager for several state-funded ISID projects, working with EGLE project managers to define and execute the scope of work to meet project objectives while maintaining project budget. Chad prepared technical documents, such as work plans, project status reports, and data reports with detailed conceptual site models. At a state-funded chlorinated solvent site located in South Haven, Chad prepared construction specifications and assisted with the design of a thermal remediation system utilizing resistive heating coupled with soil vapor extraction. At a former chemical plant (now Superfund site) located near Muskegon, Chad completed a detailed remedial investigation on behalf of EGLE to evaluate the integrity of a confining layer beneath a slurry wall containment system. Chad also prepared a feasibility study on behalf of EGLE at a Superfund site located in Baldwin, Michigan to address an extensive chlorinated solvent (PCE) plume discharging to the Pere Marquette River.

With ERM, Chad was based in Holland, Michigan until 2011, and Australia from 2011 through 2016. While in Australia, Chad served as the program manager for a portfolio of active and decommissioned power stations located across western Australia. Chad also served as the contaminated site management team's technical lead with responsibility for staff technical development and senior review of project documents. Other projects in Australia included managing the remedial investigations and feasibility studies at a number of service station

YEARS OF EXPERIENCE

5 years — Fishbeck
29 years — total

EDUCATION

MS in Environmental Engineering, University of Michigan, 1995

BS in Civil Engineering, University of Michigan, 1994

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer – Michigan, Indiana, Kentucky

Certified Underground Storage Tank Professional

OSHA 40-hour HAZWOPER

TRAINING

Battelle Remediation of Recalcitrant Compounds, 2022

Great Lakes PFAS Summit

ITRC Petroleum Vapor Intrusion Workshop

ASTM Risk-Based Corrective Action Applied at Petroleum Release Sites

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CHAD WEBER, PE

SENIOR ENVIRONMENTAL ENGINEER

sites, development and implementation of closure strategies, and the design and construction of a large multi-phase vacuum extraction system for recovery of LNAPL at a bulk fuel terminal.

Prior to 2011, Chad managed a variety of projects including Phase I and II ESAs, BEAs, due care compliance evaluations, and decontamination/demolition projects. Chad's project involvement included a number of Brownfield redevelopment sites (with grant and loan funding received through the State of Michigan), regional petroleum pipelines, leaking underground storage tank sites, paper mills, dry cleaners, automotive, and other commercial and industrial facilities.

EXPERIENCE

- Performed design, construction specifications, bidding, construction oversight, and O&M for remediation systems including soil vapor extraction, LNAPL recovery, *in-situ* chemical oxidation, *in-situ* thermal, enhanced reductive dechlorination, air sparging, direct contact exposure barrier, vapor intrusion mitigation systems, and contaminated soil excavation.
- Directed multiple high resolution site characterization (HRSC) investigations using laser-induced fluorescence (LIF), membrane interface probe/hydraulic profiling tool (MiHPT), and rotary sonic drilling approaches to improve the understanding of source mass distribution and allow for refinement of the conceptual site model.
- Performed environmental assessment and implemented mitigation/remediation activities to address due care obligations during construction of various public infrastructure and commercial/residential redevelopment projects.
- Designed and constructed passive and active (sub-slab/sub-membrane depressurization) mitigation systems to address vapor intrusion risks in numerous residential and commercial/industrial buildings.
- Prepared work plans and implemented incremental sampling methodology (ISM) approach to characterize exposure risks and determine disposal options for contaminated soils.
- Prepared construction specifications and assisted with the design of a thermal remediation system on behalf of EGLE utilizing resistive heating coupled with soil vapor extraction to treat a chlorinated solvent plume in a residential setting.
- Completed a detailed remedial investigation on behalf of EGLE at a former chemical plant to evaluate the integrity of a confining layer beneath a slurry wall containment system.
- Prepared a feasibility study on behalf of EGLE/MDEQ for remediation of a chlorinated solvent (PCE) plume at a Superfund site located in central Michigan.
- Designed and implemented an enhanced reductive dechlorination/zero valent iron approach to treat a chlorinated solvent plume; project also involved RCRA permitting and inspection/maintenance of a waste pile cap to comply with permit requirements.

PUBLICATIONS

Lepczyk, P., and Weber, C., "A Novel Approach to Characterize a Chlorinated Solvents Plume Beneath an Extensive Wetland System" Poster presentation at the Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, California May 25, 2022.

Lepczyk, P., Weber, C., and Colvin, M., "High-Resolution Characterization of a Source Area and its Downgradient Plume to Optimize Full-Scale ERD Design" Poster presentation at the Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, California May 25, 2022.

MICHAEL APGAR

SENIOR ENVIRONMENTAL ENGINEER

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	1998–present	Senior Environmental Engineer
	1996–1998	Process Department
Michigan State University, Center for Microbial Ecology	1992–1995	Graduate Assistant
Ann Arbor and Dexter Community Public Schools	1989	Substitute teacher

PROFESSIONAL SUMMARY

Mike has worked in the environmental sector for 28 years, 26 of those with Fishbeck. From 1993 to 1995, Mike was a graduate assistant in the Center for Microbial Ecology at Michigan State University where he worked on *in-situ* remediation of VOCs at the West K-L Landfill site in Oshtemo Township, near Kalamazoo, Michigan. After graduation, Mike was hired by Fishbeck where he worked in the Process Department from 1996 to 1998. His responsibilities included municipal water distribution modeling, water treatment plant design, wastewater treatment plant design, operation and maintenance of several SVE and groundwater pump and treatment systems, and design and maintenance of several industrial wastewater treatment systems.

Mike moved to the Environmental Department at Fishbeck in 1998 and continues to work in remediation. He has expertise in biologically mediated and chemical oxidative/reductive *in-situ* remediation (chlorinated compounds, metals, BTEX) and physical remediation processes (SVE, air sparging, and excavation).

Mike has designed, implemented and tracked in-situ biologically mediated chlorinated solvent remediations in California, Florida, Michigan, Missouri, Ohio, and Virginia. He is currently involved in several legacy chlorinated solvent remedial efforts and several active chlorinated solvent remedial projects.

Mike has been working on PFAS since 2018. He has experience treating PFAS impacted soil and groundwater using binding agents, ion exchange and granular activated carbon. During the 2018, 2019, and 2020 construction seasons, he managed three groundwater extraction treatment systems for BTEX and PFAS removal for discharge to the City of Grand Rapids Water Resource Recovery Facility (WRRF), including work at the Market Avenue/Fulton Street interceptor replacement project. Currently, Mike is assisting a large local manufacturing firm with PFAS exceedances in their discharge to the Grand Rapids WRRF and an international firm in the western Upper Peninsula with treatment of PFAS impacted drinking water.

Mike has assisted a local healthcare company and a local insurance company with drinking water distribution system corrosion issues at several of their facilities. He employed microbial genomic sequencing to identify and enumerate organisms populating a hot water distribution system for one of these clients.

Mike has experience working with local and state regulatory agencies and assisting clients with compliance with various regulatory permits. Since 2015, he has worked with a multinational consumer products firm in California, assisting them with compliance with their NPDES permit. In 2019, he designed, initiated, and completed a permit mandated one-and-a-half-year long temperature study in the Sacramento River at the facility's discharge. Mike assisted them with reapplication for their NPDES permit, including writing the permit and providing associated language, tables and figures, and meetings and negotiations with the state. Mike is currently assisting them with their NPDES permit discharge compliance with the permit associated mandates.

YEARS OF EXPERIENCE

26 years — Fishbeck

28 years — total

EDUCATION

MS in Environmental Engineering, Michigan State University, 1995

BS in Science/Biology, University of Michigan/Flint, 1985

REGISTRATIONS/ CERTIFICATIONS

OSHA 40-hour HAZWOPER

MEMBERSHIPS

Michigan Association of Environmental Professionals

TRAINING

Great Lakes PFAS Summit

AIPG Workshop, Higgins Lake, Michigan

RemTEC Technology Summit

Battelle Recalcitrant Compounds Conference

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MICHAEL APGAR

SENIOR ENVIRONMENTAL ENGINEER

Mike has performed many pilot tests for the design of SVE systems, ERD systems, and sub-slab depressurization systems. Recently, in 2022, he designed, acquired parts for, and installed an SVE pilot test at a site in Mountain View, California. The system utilized an existing blower and conveyance piping.

Mike has served as the construction manager for several projects, including a large excavation/disposal project for remediation of PCB impacted soils for a large West Michigan home care products production facility and a fuel transfer station in Ferrysburg, Michigan. He has also served as the site engineer/supervisor for demolition projects in Battle Creek, Kalamazoo, and Watervliet, Michigan.

EXPERIENCE

- Over 26 years of experience designing, building, deploying, and operating various *in-situ* remedies in Michigan, Ohio, Florida, Missouri, Virginia, and California.
- Construction management for a fuel distribution center remediation project.
- Sampling and data management for a municipal lagoon rehabilitation project.
- Construction manager for a PCB remediation project in the Grand Rapids area.
- Management and reporting for two 1,000 gpm granular activated carbon groundwater extraction treatment systems discharging to the WRRF in Grand Rapids.
- Design (pilot testing), acquisition, construction, and installation of a sub-floor depressurization system at an elementary school in Lowell, Michigan.
- Design, construction, implementation, and operation of an extraction system to recover and treat 1-4 dioxin impacted groundwater.
- Design, construction, implementation, operation, and field management of multiple treatment systems for a multi-year in-situ remediation of several TCE impacted groundwater sources and associated plumes in Pinellas Park, Florida.
- Design, construction, implementation, operation, and field management of a mobile recirculation treatment system for a multi-year *in situ* remediation of chlorinated solvents in Mountain View, California.
- Design, acquisition, installation, and operation of multiple air sparging applications in Missouri and Michigan.
- Performed contractor oversight at multiple demolition projects.

PRESENTATIONS/PUBLICATIONS

Annual AIPG Michigan Technical Workshop, 2022. Presenter. Combining Biotic and Abiotic Enhanced Reduction approaches to Optimize the Remediation of a Chlorinated Solvent Source Area.

Annual AIPG Michigan Technical Workshop, 2019. Presenter. Installation of a Sub-Slab Depressurization System to Facilitate a Property Transaction in Western Michigan.

Annual AIPG Michigan Technical Workshop, 2016. Presenter. TCE-A New Challenge in Remedial Work.

CHRISTOPHER CAREW

SENIOR GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2006–present	Senior Geologist
DeLisle Associates	2005–2006	Industrial Hygienist
Southwest Michigan Land Conservancy	2004–2005	Field Conservationist
Food Dance, Inc.	2003–2004	Restaurant Manager
U.S. Peace Corps	2000–2002	Environmental Education/Community Development

PROFESSIONAL SUMMARY

Chris is a project manager in the GeoSciences/Remediation Department. His consulting and management experience is focused on contaminated sites regulated under the Michigan Part 201 program, Superfund (CERCLA) sites, Brownfield redevelopment, Phase II ESAs, and remedial investigations. Chris has managed all aspects of projects from the initial proposal, work plan investigation, budget tracking, staff coordination, subcontractor management, data analysis, technical reporting, project closeout, and record retention. He has extensive experience in investigative field methods for contaminated groundwater, surface water, soil, soil gas, and wastewater. He is a Certified Industrial Wastewater Operator and works on behalf of his clients to manage compliance reporting, maintenance, and permitting for remediation and treatment systems. He oversees drilling activities and soil boring documentation for the installation of production wells, residential wells, monitoring wells, injection wells, soil vapor wells, and geotechnical borings. Chris has served on the Kalamazoo County Brownfield Redevelopment Authority and Economic Development Corporation since 2013 whose mission is to facilitate and support the redevelopment of Brownfield sites throughout Kalamazoo County.

Chris also has a variety of industrial hygiene experience for commercial, manufacturing, municipal, and governmental clients. His experience includes OSHA exposure monitoring and indoor air quality assessments. Chris leads hazardous material building inspections and is a State of Michigan licensed asbestos building inspector. He has trained hundreds of people in seven states in a wide variety of health and safety and OSHA compliance topics.

At Southwest Michigan Land Conservancy, Chris focused primarily on environmental conservation and education. His duties included prairie fen habitat restoration for the endangered Mitchell's Satyr butterfly, annual species surveys, and invasive species control and removal.

Chris served two years as a volunteer in the U.S. Peace Corps from 2000–2002. Chris partnered with a governmental organization called the Institute of Jamaica, Natural History Division and lived at the Mason River Field Station in rural Central Jamaica. His duties included environmental education, conservation, community outreach, and development. Chris traveled to schools throughout Jamaica teaching the importance of environmental conservation and showcasing the rare and endemic flora and fauna found on the nature reserve. Chris led educational tours of the nature reserve where he lived and became an expert on local plant and bird identification. He also worked with local schools to obtain basic resources to give teachers and students access to computers and books to create a resource library.

EXPERIENCE

- Certified Operator (A-1g, A-2d) and project manager for groundwater remediation systems and groundwater discharge permits. Coordination of operations and maintenance, area wide groundwater monitoring, data analysis and compliance reporting.

YEARS OF EXPERIENCE

16 years — Fishbeck
17 years — total

EDUCATION

BS in Geology, Western Michigan University, 1999

Geological Field School, Southern Utah University, 1998

U.S. Peace Corps, Institute of Jamaica – Mason River Field Station, 2002

REGISTRATIONS/ CERTIFICATIONS

Certified Industrial/Commercial Wastewater Operator – Sub-Surface Disposal

Certified Industrial/Commercial Wastewater Operator – Air Stripping Remediation

Licensed Asbestos Building Inspector

MEMBERSHIP

Kalamazoo County Brownfield Redevelopment Authority/ Economic Development, 2013–present

TRAINING

OSHA 40-hour HAZWOPER

Asbestos Contractor/Supervisor – Michigan, Florida

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CHRISTOPHER CAREW

SENIOR GEOLOGIST

TRAINING (CONTINUED)

Confined Space Entry Training

OSHA 10-hour Construction Awareness

NUCA Excavation Safety & Competent Person

Visible Emissions Training

Certified NIOSH 582 Equivalency

AIHA Asbestos Analysts Registry Proficiency Program

Hazard Communication

Emergency Preparedness

Blood Borne Pathogens

Hurley Write, Inc. course for professional writing

PSMJ Project Management Boot Camp

Great Lakes PFAS Summit

- Superfund/CERCLA sites: plume fate and transport analysis, groundwater attenuation analysis, groundwater/surface water monitoring programs, landfill cap inspections, institutional controls update, operation and maintenance activities at source, and surrounding areas.
- Remedial investigations and contaminated source area delineation using direct imaging MIHPT drilling methods. Managed indoor air sampling, sub-slab soil gas sampling, and completion of a pilot test for the installation of a sub-slab depressurization system.
- Comprehensive PFAS investigations of impacted groundwater, surface water, soil, and sludge. Pilot study for the *in-situ* sequestration of PFAS in soils and sludges in former infiltration lagoons.
- Technical reporting for CERCLA sites, conceptual site models (CSM) development, and response activity plans.
- Designed investigations to evaluate various geological (both unconsolidated and bedrock) and hydrogeological data including lithology and aquifer characteristics.
- Drilling oversight (Geoprobe, hollow-stem auger, rotosonic) during installation of productions wells, monitoring wells, injection wells, soil gas wells, and SVE wells.
- *In-situ* enhanced anaerobic bioremediation of chlorinated solvent impacted groundwater using emulsified oil substrate.
- Direct injection of potassium permanganate used for *in-situ* chlorinated solvent remediation. Oversight of drilling activities during installation of the SVE system.
- Managed site investigations using incremental sampling methodology (ISM).
- Secured site assessment grant funding through the Kalamazoo County Brownfield Redevelopment Authority to complete due diligence activities.
- Oversight during drilling activities related to UST assessment investigations and closure activities.
- Aboveground storage tank and associated secondary containment inspections in compliance with SPCC plan. Oversaw AST and vault inspections as confined space entry supervisor.
- Mann-Kendall data analysis of contaminate concentration trends over time.
- Hazardous building material inspection surveys for public schools, manufacturing facilities, universities, etc.
- NESHAP compliance inspections for pre-demolition.
- OSHA exposure monitoring and negative exposure assessments in manufacturing facilities, and demolition and abatement oversight.

RICK DUNKIN, CPG, LPG

SENIOR GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2019–present	Senior Geologist
EcoRock Consulting, LLC.	2009–2019	President/Senior Geologist/Technical Project Manager
Materials Testing Consultants	2014–2019	Senior Environmental Scientist
Global Remediation Technologies	2015–2019	Senior Hydrogeologist
Weston Solutions, Inc.	2003–2009	Office Manager, Client Services Manager, Principal Project Manager
MACTEC Eng. & Consulting, Inc.	1990–2003	Department Manager, MDEQ Contract Manager, Senior Hydrogeologist/Project Manager
Environmental Resources Management	1988–1989	Hydrogeologist/Geoscientist
Exxon Coal USA	1981–1988	Senior Coal Geologist, Project Manager

YEARS OF EXPERIENCE

5 years — Fishbeck
41 years — total

EDUCATION

MBA in Finance, Walsh College, 2006

MS in Geology, University of Toledo, 1982

BA in Geology/Environmental Studies, Susquehanna University, 1979

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist – American Institute of Professional Geologists

Licensed Professional Geologist – Indiana

Residential Builders License – Michigan

HAZWOPER Site Worker, Supervisor

MEMBERSHIPS

National Groundwater Association

American Institute of Professional Geologists/Michigan Section

- Workshop for Environmental Risk Management/Co-chair, 2014–2018

PROFESSIONAL SUMMARY

Rick Dunkin is a senior geologist with Fishbeck. In this capacity, he provides project management and technical support to the Environmental Service Division. He currently manages groundwater assessment, monitoring, and remediation projects across Michigan and various states impacted with a variety of compounds of concern, including chlorinated solvents, petroleum hydrocarbons, and metals regulated under state authority; and is adept with assessing site environmental conditions, determining appropriate actions, and creating strategies to meet regulatory and client needs.

For the past 35 years, Rick has been a geologist, department and office manager, MDEQ ISID program/project manager, and regulatory specialist in the environmental consulting business. He collaborates with clients to solve complex risk management concerns given uncertain choices and trade-offs and to understand and navigate environmental regulations and regulatory processes. Among his key focus areas are water resources related to environmental legacy contamination, contaminated sediments, oil/gas fields, and groundwater surface water interaction (GSI) assessments. Rick's project experience includes developing conceptual site models (CSMs), hydrogeologic investigations, site characterization, interim response actions, soil/sediment and groundwater remediation, underground storage tank activities, vapor intrusion and methane gas assessments and interim response actions, Brownfield demolitions, and regulatory support services including community outreach/public meetings support for regulators. He has extensive experience with assembling and oversight of teams to conduct emergency response efforts in support of damaged property and impaired environmental conditions caused by chemical spills, hurricanes, and floods. Rick prepared or assisted with technical analysis reports for major contaminated sediment Superfund projects in the Great Lakes, Pacific Northwest, and Atlantic Northeast, and geomorphic analysis for the Kalamazoo River Superfund site, as well as low-level radioactive and non-radioactive contaminated soil at a major USDOE site. Prior to environmental consulting, Rick worked for seven years in the coal mining industry for Exxon Coal USA (subsidiary of ExxonMobil) as a project manager and geologist for sites across the US, and then as an environmental/permit specialist at mine headquarters and hydrogeologist and quality control engineer at the Caballo Mine in Gillette, Wyoming.

EXPERIENCE

- Prepared detailed conceptual site models (CSMs) that identify contaminant sources, transport pathways, and potential receptors; and provided an accurate understanding

RICK DUNKIN, CPG, LPG

SENIOR GEOLOGIST

MEMBERSHIPS (CONTINUED)

Michigan Association of Environmental Professionals

- Board of Directors, 2014–2019
- President, 2017–2018

TRAINING

Vapor Intrusion Training, Interstate Technology & Regulatory Council

EGLE-RRD Cleanup Criteria Training

40-hour HAZWOPER Certified with Annual 8-hour Refresher

8-Hour Site Manager and Supervisor Training

Site Health and Safety Coordinator Training

10-Hour Construction Safety Training

Shipping and Transporting Dangerous Goods Training

OSHA Bloodborne Pathogens Training

First Aid/CPR Refresher Training

Radiation Worker Safety Training

of their contribution to environmental risk management.

- Relationship building, collaboration, and negotiation with regulators; including state, local, and federal government environmental agencies.
- Part 213 leaking UST investigations, remedial activities, and compliance report preparation.
- Vapor intrusion and methane gas assessments and response activity planning.
- Prepared site investigation work plans/proposals, direct day to day field activities, analyze and interpret environmental data, and prepare technical environmental reports.
- Conducted high resolution site characterization (HRSC) investigations using a membrane interface, hydraulic profiling tool and an optical interface, and hydraulic profiling tool to identify organic compounds and methane gas in the subsurface.
- Assembled, managed, and led teams of scientists/engineers and subcontractors to safely perform Part 201 RI/FS work, design, and install remedial systems, and provide contractor management and oversight services at environmental contamination legacy sites.
- Remedial investigations and risk assessment protocols applied to varying contaminant situations including organics, metals, PCBs, pesticides, and radioactive materials.
- Designed and implemented groundwater monitoring systems at industrial facilities and solid waste disposal areas to monitor site activities and/or investigate contamination.
- Hydrogeologic characterization of landfill sites, installation of methane venting systems, and groundwater monitoring at landfills.
- Pre-demolition site characterization, waste characterization, asbestos and structural assessments, preparation of biddable specifications documents, trade contractor procurement assistance, management of staff providing oversight of demolition contractor activities, and post-demolition soil and groundwater sampling to facilitate property redevelopment.
- ESAs and due diligence activities to establish property conditions for real estate transactions.

PAUL FRENCH

SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Senior Hydrogeologist
Envirologic Technologies, Inc.	1992–2023	Project Manager/Hydrogeologist
American Hydrogeology, Inc	1989–1992	Geologist
Keck Consulting Company	1986–1989	Draftsman/Geologist

PROFESSIONAL SUMMARY

Paul is a senior hydrogeologist with Fishbeck. Although his primary focus at Fishbeck is in vapor intrusion, Paul continues to manage numerous leaking underground storage tank (LUST) release sites and industrial facilities with environmental conditions.

Paul has extensive experience at sites with vapor intrusion issues including implementation of soil gas investigations, risk evaluation, as well as design, installation, and operation of active and passive mitigation systems. Paul has been actively involved in a stakeholder advisory group that has been assisting EGLE with revisions to the 2013 Vapor Intrusion Guidance Document, specific to vapor mitigation design, installation, and operation. He is also an active member if the Michigan Petroleum Association Environmental Issues Committee.

Paul has a broad understanding of Michigan's Part 201 Environmental Remediation, Part 211 UST, and 213 LUST programs, and has over 36 years of experience involving hydrogeologic investigation, cleanup, and closure of LUST sites and industrial facilities and Brownfield sites with environmental conditions. He has conducted hundreds of UST removals and has developed and completed hydrogeologic investigations and implemented remedial action plans involving source removal, NAPL recovery, groundwater pump and treat, soil vapor extraction, and *in-situ* bioremediation.

Paul has successfully managed UST and other Brownfield funding programs at numerous sites to implement investigative and remedial action and due care compliance. Paul has extensive technical writing experience and has prepared hundreds of documents including UST site assessments, hydrogeologic investigation and remedial action plans, risk assessment, closure, due diligence, and due care compliance reports. Paul understands that a good working relationship between the consultant, client, regulatory agencies, contractors, and other stakeholders is a primary component of successful project implementation.

Paul started his professional career as a draftsman at Keck Consulting and shortly began working as a field geologist overseeing soil boring and monitoring well installations and collecting samples. At American Hydrogeology, he continued to oversee field operations and began to manage projects. He started as a project manager at Envirologic and has since begun to specialize in select areas of the industry.

EXPERIENCE

- Vapor intrusion assessment/design, installation, and operation of vapor intrusion mitigation systems.
- Planning, coordination, management, and implementation of UST removals and site assessments at Part 211 sites.
- Implementation of hydrogeologic investigations and remedial activities including source removal, NAPL recovery, groundwater cleanup, and *in-situ* bioremediation at Part 201 and Part 213 sites.
- Risk assessment.
- Management of Brownfield redevelopment projects.
- Management and operation of remedial/migration systems.

YEARS OF EXPERIENCE

30 years — Fishbeck
37 years — total

EDUCATION

BS in Geology, Murray State University, 1982

Graduate Certificate in Applied Hydrogeology, Western Michigan University, 1989–1991

REGISTRATIONS/ CERTIFICATIONS

Licensed Wastewater Treatment Plant Operator (Carbon + Oil Water Separation)

EGLE Storm Water Management Operator

Licensed Asbestos Inspector

HAZWOPER Site Worker

MEMBERSHIPS

Association of Vapor Intrusion Professionals

Association of Ground Water Scientists and Engineers, Division of the National Groundwater Association

Michigan Petroleum Association, Environmental Issues Committee

American Institute of Professional Geologists/Michigan

Michigan Association of Environmental Professionals

fishbeck

BRUCE GILLETT, CPG

SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2017–present	Team Leader/Senior Hydrogeologist/Project Manager
	2001-2017	Senior Hydrogeologist/Project Manager
	1998-2001	Hydrogeologist
Panterra Corporation	1995-1998	Hydrogeologist/Graduate Research Assistantship
Dell Engineering, Inc.	1989–1992	Geologist
WW Engineering/ Earth Tech	1990-1993	Geologist

YEARS OF EXPERIENCE

25 years — Fishbeck
33 years — total

EDUCATION

MS in Hydrogeology,
Wright State University, 1998

BS in Earth Science Education,
Western Michigan University,
1990

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist,
American Institute of Professional Geologists – Michigan

OSHA HAZWOPER Site Worker

MSHA Part 46 and Part 48 Training/First Aid / CPR / AED

MEMBERSHIPS

American Institute of Professional Geologists

National Ground Water Association

Michigan Aggregate Association

Air & Waste Management Association

PROFESSIONAL SUMMARY

Bruce is a project manager and team leader in the GeoSciences/Remediation Department. In this role, he is responsible for project manager accountability in addition to matching staff talents and abilities with the needs of each project. As a senior hydrogeologist, Bruce has experience in a wide range of problem-solving methods including geophysics, geostatistics, GIS, and chemical hydrogeology with a strong emphasis on physical hydrogeology. He is particularly specialized in groundwater flow and contaminant transport modeling.

During his 25 years at Fishbeck, Bruce has been involved in a diverse array of projects including groundwater supply, hydrogeological evaluations, remedial investigations, conceptual site model development, and remedial design/implementation. His project experience includes groundwater discharge permits, wastewater land application studies, GSI/mixing zone evaluations, feasibility studies, RAPs, site closure reports, no further action reports, groundwater resource investigations, wellhead protection plans, inland lakes and streams permitting, *in situ* remediation projects, vapor intrusion evaluations, and, more recently, PFAS investigations. Some key projects include management and remediation of a hexavalent chromium release for an international automotive parts supplier (MAHLE) which included *in situ* chemical reduction of hexavalent chromium in soil and groundwater, AS-SVE system operations to remediate TCE impacts, and development and implementation of a restrictive covenant to prevent potential exposure risks. MAHLE has awarded additional projects to Fishbeck, in part, due to the success of this project. Bruce is also client manager/ project manager of a project involving chlorinated solvent releases beneath the floor of an active manufacturing plant in West Michigan (Bradford White Corporation). The project involves the use of *in situ* bioremediation (ERD) by injection of emulsified soybean oil; more recently this process was enhanced by injection of iron sulfate heptahydrate to activate the abiotic pathway in addition to the biotic degradation. This project also includes groundwater extraction and treatment (air stripping) to prevent offsite migration and active SVE/SSDS to prevent vapor intrusion. Bruce is also the practice lead for hydrogeological investigations in support of aggregate industry projects.

While earning his master's degree at Wright State University, Bruce worked part-time at Panterra Corporation as part of his graduate research assistantship where he gained valuable mentoring and experience in groundwater modeling. In addition, he continued to gain additional field work and consulting experience including assisting in the operation and maintenance of a leachate collection and treatment system for a large cement kiln dust landfill as well as other hydrogeologic investigation activities including aquifer testing field experience.

Prior to graduate school while at WW Engineering/Earth Tech and Dell Engineering, Bruce gained broad work experience particularly in field investigations. Types of projects included Phase I and II ESAs, UST investigations/removals, and larger investigation/remediation

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BRUCE GILLETT, CPG

SENIOR HYDROGEOLOGIST

TRAINING

Calibration, Uncertainty Analysis, and Optimization, Environmental Simulations Inc., Short Course for Groundwater Vistas and MODFLOW

MODFLOW and More Conference, Golden, Colorado (2015, 2017 and 2019)

Great Lakes PFAS Summit

Site Applications of Geostatistics and Time Series Analysis, Short Course, 2016 Battelle Chlorinated Conference

Incremental Sampling Methodology, ITRC

Sampling Strategies and Statistics Training for Part 201 Cleanup Criteria, MDEQ

PSMJ Project Management Boot Camp

Well Design and Chemical Cleaning, Disinfection, and Redevelopment of Water Wells, Johnson Screen Company

Natural Attenuation for Remediation of Contaminated Sites, NGWA Short Course

Advanced Techniques for Evaluating and Quantifying Natural Attenuation, NGWA Short Course

Groundwater Flow and Transport Modeling with GMS, EMS I Training Course

Intro to ArcGIS, ESRI Short Course

Intro to Geodatabases, Michigan State University RS & GIS Course

projects. A key project included a large hydrogeologic investigation covering over 2,000 acres at a paper manufacturing plant in Escanaba, Michigan. The project involved coordination and supervision of three drilling rigs and field personnel for the hydrogeologic investigation. Drilling methods included dual tube reverse circulation, hollow stem auger, cable tool, and bedrock core drilling. He assisted in the evaluation, analysis, and reporting of collected data. The purpose of the investigation was to develop an overall hydrogeologic background for the site to support a RAP and other expected studies. Field tasks included coordination of access to drill sites; installation of 51 monitoring wells and three test wells; coordination of soil and groundwater sampling; slug testing of the monitoring wells; bedrock fracture mapping; river level monitoring; and inspection of 75 existing wells. Evaluation and analysis of data included slug test evaluations, regional hydrogeologic research, bedrock fracture orientation analysis, cross section development, potentiometric surface and water table contour maps, bedrock topographic contour maps, flow velocity maps, coordination and organization of the analytical results, and report writing.

EXPERIENCE

- Client manager for an international automotive industry supplier with multiple sites involving various contaminants of concern including hexavalent chromium, chlorinated solvents, petroleum hydrocarbons, per- and polyfluoroalkyl substances (PFAS), and various other metals impacts. Responsible for coordinating project teams to address the various impacts in all environmental media including soil, sediment, groundwater, vapor, and surface water.
- Constructed analytical and 3D numerical groundwater models in support of various projects including Wellhead Protection Programs, mounding analyses, underdrain system designs, Part 301 Inland Lakes and Streams Act permitting for lake expansion, construction dewatering, water supply and well field evaluations, contaminant fate and transport including dual density models, landfill design/monitoring including variably-saturated groundwater flow modeling, well siting evaluations, and long-term well field sustainability projections.
- Designed, conducted, and evaluated numerous aquifer pumping tests for various clients including municipalities, remediation projects, and private water supply projects.
- Designed and implemented long-term monitored natural attenuation groundwater sampling and analysis plans.
- Designed and managed hydrogeological investigations and groundwater modeling studies for multiple sites to evaluate and assist in the engineering design of groundwater underdrain systems to alleviate flooding conditions in residential neighborhoods. Analytical or numerical groundwater flow modeling was used to evaluate the best design layouts to eliminate basement flooding while not adversely impacting nearby wetlands.
- Client manager for a local industry with environmental cleanup activities related to chlorinated solvents released beneath the active production facility. Environmental response activities include enhanced reductive dechlorination (ERD) in the source area (including both biotic and abiotic pathways), vapor intrusion mitigation system investigation, design, operation, and maintenance, ongoing source area and downgradient groundwater monitoring, extraction trench and extraction well for groundwater plume capture, groundwater air stripping and associated NPDES permitting/monitoring, mixing zone determination and compliance monitoring, constructed wetland mitigation monitoring and maintenance, and preparation of a groundwater use restriction ordinance.
- Fishbeck practice leader for hydrogeological investigations in support of the aggregate mining industry including Part 301 Inland Lakes and Streams Act permitting and large-quantity water withdrawal evaluation and permitting.
- Managed and conducted a multidisciplinary investigation to answer questions related to development of one of the largest municipal parks in the nation. Responsibilities included managing various aspects of the project including hydrologic and hydraulics analysis, surface water quality evaluation for both streams and lakes, groundwater flow, surveying, driller and laboratory subcontracting, cost estimating, and client contact.

BRUCE GILLETT, CPG

SENIOR HYDROGEOLOGIST

- Water supply well projects encompassing all aspects including well siting, well design and permitting, aquifer test analysis and safe yield calculations, large-quantity water withdrawal permitting, and all associated reporting.
- Preparation of site investigation work plans and proposals.
- Implementation of hydrogeological investigations and remediation activities under varied regulatory authorities including RCRA, CERCLA, Part 201, Part 213, Part 31, Part 301, and Part 303.
- Coordination of design, construction, operation, and maintenance of remedial systems including groundwater extraction and treatment, soil vapor extraction and air sparging systems (AS/SVE), and vapor intrusion mitigation systems.
- Data collection and analysis of wetland/groundwater monitoring data for wetland mitigation design and implementation.
- Managed and conducted hydrogeological investigations for two large-scale wastewater spray irrigation sites for the food processing industry. The investigations included soil borings, monitoring wells, permeameter testing, hydraulic conductivity testing, groundwater and soil sampling, mounding analyses, and residential well inventory and sampling. The investigations were conducted for groundwater discharge permits in compliance with EGLE regulations for land application of wastewater disposal.
- Hydrogeologist responsible for delineation methods including both analytical and numerical groundwater flow models of Wellhead Protection Areas for several clients including:
  - City of Battle Creek, Michigan
  - Verona Well Field and Columbia Well Field, Battle Creek, Michigan
  - Michigan State University, East Lansing, Michigan
  - City of Fremont, Michigan
  - City of Grand Ledge, Michigan
  - Village of Baldwin, Michigan
  - City of Cedar Springs, Michigan
  - City of Portage, Michigan

PUBLICATIONS/PRESENTATIONS

Reclamation Guidance and Success Stories: Converting Active Mines to the Next Phase, Bruce Gillett, CPG, Fishbeck, Rob Hayes, P.E., Holcim US – Great Lakes Region – Sue Hanf, P.E., Stoneco, (Co-presenters), Michigan Aggregate Association – 2023 Annual Conference, Battle Creek, Michigan.

Michael Apgar, Fernanda Wilson, Bruce Gillett. "Combining Biotic and Abiotic Enhanced Reduction Approaches to Optimize the Remediation of Chlorinated Solvents Source Area". AIPG Michigan Section 11th Annual Environmental Risk Management Workshop Best Practices for Groundwater Remediation and Management. 2022

F.P. Wilson, M.S. Apgar, B.E. Gillett, D. Leigh, and J. Valkenburg. "Chlorinated Solvent Source Area Remediation: Combining Biotic and Abiotic Enhanced Reduction Approaches". Battelle: Fifth International Symposium on Bioremediation and Sustainable Environmental Technologies. 2019

Apgar, M., Gillett, B., and Lisiecki, J., "Hexavalent Chromium Remediation in Soil and Groundwater," Poster presented at the REMTEC Remediation Technology Summit, Chicago, Illinois, May 2011.

Gillett, B., "Hydrogeological Evaluation for Millennium Park, Kent County, Michigan" Abstract presented at the Proceedings of the 44th Annual Meeting of the American Institute of Professional Geologists, Traverse City, Michigan, October 2007.

Gillett, B.E., 1997, "Geostatistical Characterization of the Mahomet Sand, Champaign County, Illinois" Thesis (M.S.) – Wright State University, 1998

DERRICK LINGLE, CPG

SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Senior Hydrogeologist
Envirologic Technologies, Inc.	2017–2023	Project Manager/Hydrogeologist
	2013–2017	Intern/Project Geologist

PROFESSIONAL SUMMARY

Derrick is a senior hydrogeologist and team leader with Fishbeck. In this role, he provides technical support; workload, personnel, and resource management for his technical team; and prepares project proposals. His expertise is in contaminant and hydrogeological investigations under Michigan Part 111, 201, and 213, as well as the EPA RCRA program. Derrick has extensive field experience with vapor intrusion studies, groundwater, and surface water interface evaluations, and contaminant delineation in various media. He has also assisted with the design and installation of sub-slab vapor mitigation systems. Derrick manages several complex sites that are in varying phases of investigation and remediation, while maintaining project budgets and navigating project objectives with various private and public stakeholders. Of note, he is Fishbeck's lead manager for three heavily contaminated former solvent recycling facilities across Michigan that have required a significant effort to investigate, mitigate, and remediate the release of chlorinated solvents, while working in conjunction with EGLE as well as the EPA and their START contractors. Derrick has also been the lead or co-lead manager for the investigation and cleanup of three decommissioned coal-fired power plants (former DTE Marysville Power Plant, former DTE Harbor Beach Power Plant, and former MSCP Endicott Power Plant). He has extensive experience preparing technical documents, such as response activity plans, closure reports, and NFA reports, as well as institutional controls for various contaminated sites across Michigan.

EXPERIENCE

- Managed and implemented hydrogeologic and remedial investigations at facilities such as power plants, oil terminals, solvent recovery sites, and retail petroleum distribution centers under Michigan Parts 111, 201, and 213 and EPA RCRA Program.
- Perform sampling, removal, and oversight of USTs, coal storage area, coal ash pond, and landfill projects.
- Conduct conceptual site model development and prepare closure/NFA reports.
- Perform statistical analysis of soil data for decommissioned coal-fired power plants.
- Interpret groundwater isotope data.
- Design and install sub-slab vapor mitigation systems.
- Conduct LNAPL monitoring and recovery assessment.
- Develop and implement incremental sampling methodology plans.
- Implement and interpret MiHpt technology to characterize chlorinated plumes.

PRESENTATIONS/PUBLICATIONS

Lingle, D. A. and Rooney, K. M.; ZVI application to till via environmental fracturing. AIPG Michigan Section Technical Workshop, Roscommon, Michigan, June 13, 2023 (future).

Warwick, D. B. and Lingle, D. A.; Remedial investigation and remediation of the former Marysville Power Plant complex. AIPG Michigan Section Technical Workshop, Roscommon, Michigan, June 13, 2017.

Lingle, D. A., Kehew, A. E., and Krishnamurthy, R.V.; Use of nitrogen isotopes and other geochemical tools to evaluate the source of ammonium in a confined glacial drift aquifer, Ottawa County, Michigan, 2017, USA. Ap-plied Geochemistry, 78, 334–342.

YEARS OF EXPERIENCE

9 years — Fishbeck
10 years — total

EDUCATION

MS in Geology, Western Michigan University, 2013

BS in Environmental Geoscience, Michigan State University, 2011

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist, American Institute of Professional Geologists – Michigan

HAZWOPER Site Worker

MEMBERSHIPS

Michigan Association of Environmental Professionals

American Institute of Professional Geologists

TRAINING

Light Non-Aqueous-Phase Liquids (LNAPL) Science, Management, and Technology, Interstate Technology & Regulatory Compliance

ASTM Risk-Based Corrective Action (RBCA) Training

AIPG Technical Workshop: GSI Characterization

Great Lakes PFAS Summit

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J. MICHAEL RANCK, PG

SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2022–present	Senior Hydrogeologist
North Carolina Department of Environmental Quality	2021–2022	Environmental Program Manager
AECOM	2006–2021	Senior Project Manager/Hydrogeologist
North Carolina Department of Environmental Quality	2003–2006	Hydrogeologist
National Park Service	2000–2001	Park Ranger (Seasonal)

PROFESSIONAL SUMMARY

Mike has over 20 years of experience in both consulting and state government overseeing groundwater resources and water quality programs and working with state and federal grants, such as EPA 106 and USGS funds. He has focused on groundwater assessment and groundwater quality monitoring, including emerging contaminants such as PFAS; soil assessment and remediation, surface water quality, vapor intrusion assessment and mitigation; and acted as the project manager and technical expert for a portfolio of dry-cleaning sites under the North Carolina DEQ Dry-Cleaning Solvent Cleanup Act Program.

Mike is a senior hydrogeologist with Fishbeck. In this capacity, he provides project management and technical support to the Environmental Services Division. He currently manages groundwater assessment, monitoring, and remediation projects across Michigan and various states impacted with a variety of compounds of concern, including PFAS, chlorinated solvents, and metals regulated under state authority; and is adept with assessing site conditions, determining appropriate actions, and creating remediation strategies to meet regulatory and client needs.

Previously with the North Carolina Department of Environmental Quality as an Environmental Program Manager, Mike managed the Groundwater Resources Section and Water Quality Regional Operations Section within the Division of Water Resources. He implemented goals, policies, and procedures associated with these sections; ensured compliance with the numerous general statutes and state regulations; and oversaw the duties of staff in both sections located across the central office and seven regional offices across the state. Management and oversight of the groundwater programs included the underground injection control (UIC) program; coal ash management activities; and the groundwater management branch, responsible for a statewide network of over 700 groundwater monitoring wells to evaluate the statewide availability of groundwater and areas of aquifer overuse, climatic effects including drought conditions, and ambient groundwater quality conditions including emerging contaminants such as PFAS. Management of the water quality regional operations including program oversight of permitted NPDES and non-discharge wastewater systems, municipal pretreatment and collection systems; 401 and buffer program implementation; animal feeding operations; groundwater incident management; response to citizen complaints and incidents such as spills, fish kills and sewer overflows; emergency response actions; ambient water quality monitoring program activities and the provision of customer service and technical assistance to the general public, industry, and government agencies. Mike also oversaw emergency response program including coverage assignments, training of staff on response/notification expectations, and coordination with the NC Emergency Operations Center during emergency events such as hurricanes, ice storms, and flooding.

YEARS OF EXPERIENCE

20 years — total

EDUCATION

MS in Hydrology, New Mexico Institute of Mining and Technology, 2003

BS in Environmental Geology, Michigan State University, 2001

REGISTRATIONS/ CERTIFICATIONS

Professional Geologist – North Carolina, Pennsylvania

HAZWOPER

OSHA 8-hour Site Supervisor Training

OSHA 10-Hour Construction Safety & Health

fishbeck

J. MICHAEL RANCK, PG

SENIOR HYDROGEOLOGIST

While at AECOM, Mike coordinated the company-wide vapor intrusion technical practice group, facilitating resources and staff around the globe with vapor intrusion work including development of work plans, data evaluation, and reporting. He managed multi-disciplinary project teams to efficiently complete projects within scope, schedule, and budget constraints while maintaining compliance with applicable regulatory requirements as well as safety and quality requirements. He was a senior project manager and technical expert for environmental assessment, corrective action, risk assessment, and risk-based closure at a statewide portfolio of more than 100 dry-cleaning project sites across North Carolina managed under the NCDEQ Dry-Cleaning Solvent Cleanup Act Program.

Mike gained previous experience with the North Carolina Department of Environmental Quality as a hydrogeologist where he evaluated groundwater remediation activities for underground injection control and non-discharge programs. this included review and approval of innovative remedial approaches including chemical oxidation, chemical reduction, enhanced bioremediation, and mass removal.

Mike additionally served as a seasonal park ranger for the National Park Service where he researched, developed, and presented interpretive talks to park visitors about the significance and uniqueness of the scientific and natural resources at Badlands National Park.

EXPERIENCE

- Senior project manager and technical expert for assessment of soil, groundwater, surface water, and vapor intrusion; risk assessment; corrective action; and risk-based closure at a statewide portfolio of more than 100 dry-cleaning project sites managed under the North Carolina DEQ Dry-Cleaning Solvent Cleanup Act Program.
- Project manager overseeing groundwater sampling and corrective action, landfill gas monitoring, maintenance of landfill gas extraction system, air quality permit compliance, stormwater and erosion control permitting and compliance, and streambank restoration for a closed municipal solid-waste landfill facility.
- Principal investigator and project geologist responsible for directing geoenvironmental site assessments for the North Carolina Department of Transportation. Projects include environmental site assessments for hazardous waste and materials, underground storage tank assessments and removal, and remedial actions.
- Project manager and geologist overseeing injection of 25,000 gallons of Hydrogen Release Compound (HRC®) slurry to facilitate remediation of chlorinated solvents in a shallow aquifer at a manufacturing facility.
- Oversaw implementation of goals, policies, and procedures; ensured compliance with state and federal regulations; and managed groundwater and water quality programs for the North Carolina DEQ. Projects included emerging contaminants, underground injection control permitting, coal ash management, groundwater quality monitoring and groundwater withdrawal permitting, NPDES and non-discharge wastewater permitting, municipal pretreatment, and collection systems; 401 and buffer program implementation; animal feeding operations; groundwater incident management; response to citizen complaints and incidents such as spills, fish kills, and sewer overflows; emergency response actions; ambient water quality monitoring program activities; and the provision of customer service and technical assistance to the general public, industry, and government agencies.

JESS WATTERSON

SENIOR ENVIRONMENTAL SCIENTIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2022–present	Senior Environmental Scientist
Golder Associates	2016–2022	Senior Environmental Scientist/Lead Consultant
	2013–2016	Project Scientist
	2006–2013	Staff Scientist
EnviroSolutions, Inc.	2005–2006	Project Manager
	2002–2005	Environmental Staff Scientist
	2000–2002	Staff Scientist

YEARS OF EXPERIENCE

23 years — total

EDUCATION

BS in Environmental Science, Grand Valley State University, 1999

REGISTRATIONS/ CERTIFICATIONS

OSHA 29 CFR 1910.120 (e) (8) 8-hour HAZWOPER Refresher

First Aid/CPR/AED/BBP Training MSHA Part 46 and 48

OSHA Construction Supervisor Training

Construction Safety Training System

Workplace Hazardous Materials Information System

EGLE Industrial Storm Water Management A1i

OSHA 29 CFR 1910.120 (e) (3) 40-hour HAZWOPER Health & Safety Training

PROFESSIONAL SUMMARY

Jess is a senior environmental scientist and team leader with Fishbeck. In this capacity, he provides project management and technical support to the Environmental Service Division; workload, personnel, and resource management for his technical team; and prepares project proposals. Jess has 23 years of experience in environmental due diligence, remediation, demolition, decommissioning, and project management. He has focused on corrective action option analysis; assessing regulatory requirements; budget oversight; laboratory bench studies; onsite pilot studies; system design and construction oversight; operations, maintenance, and compliance permitting; supervision of hydrogeological assessments; soils characterization; and vapor intrusion investigations. He has managed projects impacted with a variety of compounds of concern, including petroleum hydrocarbons, chlorinated solvents, and metals regulated under state authority; and is adept with assessing site conditions, determining appropriate actions, and creating executable strategies to meet the needs of his clients.

While with Golder, Jess advanced into a client relationship manager role for a North American automotive manufacturing company. Projects include Phase I ESAs, Phase II investigations, Phase III remediation, and demolition and decommissioning in excess of $5 million annually. Work included planning, coordination, implementation, and documentation of cleanup operations at numerous spill/release sites including USTs and industrial sites. Jess has expertise in Part 213 Leaking Underground Storage Tanks (LUSTs), and Part 201 Environmental Remediation of the Natural Resource and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

While acting as a senior environmental scientist for a North American automotive manufacturing company, Jess worked with client and third-party investor in a project team setting to conceptualize a plan for remediation of multiple remediation units. The remedial units included hexavalent chrome plume, multiple chlorinated solvent plumes, and an LNAPL plume at a former manufacturing facility. Jess coordinated and managed multiple Geoprobe crews during the delineation process. He reviewed analytical data and determined the optimal area to conduct a full-scale remedial process. He assisted in the writing multiple groundwater discharge exemption permits for each of the remedial units that were approved by the Michigan Department of Environment, Great Lakes and Energy (then MDEQ). He coordinated access agreements for offsite property, managed, and directed the injection crews for multiple quarterly events for chemical reduction and enhanced anerobic bioremediation events and reviewed results of performance monitoring and provided next step recommendations.

Additionally, in a team setting, Jess helped conceptualize a plan for remediation of a hydraulic oil plume under a former plant floor of the manufacturing facility. He reviewed analytical data and determined the optimal area to install a pump and treat system, oversaw the permitting and installation of a sheet pile wall along the Huron River, assisted in the writing of

JESS WATTERSON

SENIOR ENVIRONMENTAL SCIENTIST

a groundwater discharge permit that was submitted to the Ypsilanti Community Utilities Authority (YCUA), and approved. He coordinated and managed subcontractors during the installation process of the pump and treat system, performed operation and maintenance of the pump and treat system, and collected and reported performance data to the client on a bi-weekly basis.

Jess has a strong grasp of field protocols. Early in his career his responsibilities included field management of industrial water treatment, demolition and decommissioning, groundwater, and soil remediation projects. Project aspects included but are not limited to planning, budget oversight, laboratory bench studies, onsite pilot studies, system design and construction oversight, operations and maintenance, and compliance permitting; performance and supervision of hydrogeological assessments; soils characterization; vapor intrusion mitigation; excavation; and disposal.

From 2000 to 2006, he oversaw multiple mobile dual-phase extraction systems from inception to completion which included: collection of initial soil and groundwater data for analysis, analyzed sites using project management tools, and feasibility studies. He conducted pilot tests and reduced data to determine radius of influence, well efficiency, intrinsic permeability, conductivity, transmissivity, and storage calculations. He determined and installed additional monitoring wells and delineation well locations. He used a computer modeling program to determine and install remediation wells in appropriate locations. He operated heavy machinery to install horizontal piping runs and coordinated subcontractor agreements for additional services related to remediation system installations. He conceptualized remediation mobile trailer designs and selected and ordered appropriate components for remediation trailers. He worked in team settings to construct remediation trailers, delivered, and installed them to sites; completed operation and maintenance manuals; fulfilled groundwater and vapor discharge permit requirements as implemented by EGLE; performed operation and maintenance on remediation systems; and managed field team members in weekly routine and non-routine O&M.

EXPERIENCE

- Project and client manager experience in large scale remediation and demolition projects.
- Oversee the execution of corrective actions options planning and regulatory requirement assessment.
- Oversaw and conducted multiple pilot tests for the following: *In-situ* chemical oxidation, enhanced anerobic bioremediation, soil vapor extract, groundwater pump and treat, electro-coagulation, reverse osmosis, coagulant pre-treatment and absorption, and evaporation.
- Written multiple groundwater discharge exemption permits that were submitted and approved by EGLE.
- Oversaw and conducted multiple vapor intrusion assessments, sampling events, pilot tests, and system designs.
- Managed, oversaw, and conducted the implementation of multiple laser-induced florescence for Phase II LNAPL investigations in industrial settings.
- Managed, oversaw, and conducted the implementation of multiple hydraulic profile and membrane interface probe for Phase II DNAPL investigations in industrial settings.
- Experienced in successful implementation of remedial technologies such as *in-situ* metals reduction, *in-situ* enhanced anerobic bioremediation, *in-situ* chemical oxidation, *in-situ* bio augmentation, air sparging, air stripping, activated carbon treatment, and soil vapor extraction.
- Collected initial soil and groundwater data for analysis.
- Analyzed sites using project management tools and feasibility studies.
- Conducted pilot tests and reduced data to determine radius of influence, well efficiency, intrinsic permeability, conductivity, transmissivity, and storage calculations.

JESS WATTERSON

SENIOR ENVIRONMENTAL SCIENTIST

- Coordinated subcontractor agreements for additional services related to remediation system installations.
- Conceptualized remediation mobile trailer designs and selected and ordered appropriate components for remediation trailers.
- Worked in team settings to construct remediation trailers.
- Supervised and wrote operations and maintenance programs for remedial and industrial water treatment programs.
- Fulfilled groundwater and vapor discharge permit requirements as implemented by EGLE. Performed O&M on remediation systems and managed field team members in weekly routine and non-routine O&M activities.
- Managed, analyzed, and interpreted data collected from several systems on a monthly basis.
- Summarized data in charts, graphs, plume mass calculations, hydrographs, and maps for monthly team meetings.
- Implemented problem solving meetings and preventative maintenance plans.
- Served as the full-time owner's representative to provide monitoring of the environmental aspects of decommissioning and demolition of multiple manufacturing facilities and mining facilities.
- Managed and prepared site use history assessments, regulated material surveys, and sampling plans for multiple decommissioning and demolition projects.
- Wrote and provided bidder specification for a partial demolition of a multiple manufacturing facility. Participated in weekly planning meetings to facilitate the client's expectations and work with the UAW to ensure coordination of interests.

FERNANDA WILSON, PhD

ENVIRONMENTAL ENGINEER

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2017–present	Environmental Engineer
University of Illinois	2016–2017	Post Doc Researcher
Michigan State University	2011–2015	Research Assistant

PROFESSIONAL SUMMARY

Fernanda has experience in environmental microbiology and a demonstrated history of working in bioremediation. Working at Fishbeck since 2017, she has assisted in the designing, monitoring, and evaluation of various remediation projects throughout the US. She is involved in all aspects of groundwater and soil remediation, especially in project management, design, and data analysis of remediation projects related to chlorinated solvents and PFAS. Currently, her chlorinated solvents-related work lies mostly in the design, data analysis, and reporting on the application of biologically mediated and chemical oxidative/reductive *in-situ* remediation to treat chlorinated compounds. Dr. Wilson has been working on PFAS since 2018. She has experience in developing SOPs and sampling for PFAS in various matrices, source identification, data analysis, and designing treatments for PFAS impacted soil and groundwater using binding agents, granular activated carbon, and ion exchange. Dr. Wilson was a team member of the Interstate Technology and Regulatory Council (ITRC), directly contributing to the development of fact sheets and technical documents related to the Aqueous Film Forming Foam (AFFF) chapter. Currently, she manages and operates an ion exchange system treating PFAS impacted water at an elementary school in West Michigan and is directly involved in managing and assisting the permitting, design, and implementation of a PFAS treatment system for an industrial facility in the western Upper Peninsula.

Prior to joining Fishbeck, Dr. Wilson worked with wastewater bioreactors at the University of Illinois in 2016 and 2017. She was responsible for maintaining pilot scale British Corporation (BP) bioreactors treating wastewater containing purified terephthalic acid (PTA). During that time, she developed R&D efforts to improve reactor's performance and molecular biology tools for genetic monitoring of the microbiota associated with the reactor. Preceding this work, Fernanda was a research assistant at Michigan State University where she developed molecular biology tools to monitor for the degradation of xenobiotics, including chlorinated solvents and RDX.

EXPERIENCE

- Design of treatment systems and *in situ* remediation actions for chlorinated solvents in groundwater, including injection of emulsified vegetable oil and ZVI.
- Data analysis, management, and reporting of groundwater ERD performance monitoring data. Assessment of ERD performance completion and natural attenuation monitoring data.
- Data visualization and statistical skills.
- Sampling and PFAS investigation in drinking water, groundwater, soil, sediments, wastewater, oil, and sludge.
- Support client management of PFAS-impacted water and solids, including WWTPs, landfills, and industrial clients.
- Design of PFAS remediation in groundwater and sediment (GAC and other sorption media).
- Drinking water PFAS treatment system (Ion Exchange) design, installation, performance monitoring, operation and maintenance, reporting, and project management.

YEARS OF EXPERIENCE

6 years — Fishbeck
8 years — total

EDUCATION

PhD in Environmental Engineering, Michigan State University, 2015

MS in Environmental Engineering, Michigan State University, 2012

MS in Marine Science, Federal University of Ceara, Fortaleza, Brazil, 2008

Bachelor of Biology Science, Federal University of Ceara, Fortaleza, Brazil, 2005

REGISTRATIONS/ CERTIFICATION

OSHA 40-hour HAZWOPER

OSHA Certified Environmental Specialist (ongoing)

First Aid/CPR Refresher Training

Technical Report Writing for Engineers

D5 EGLE Operator

fishbeck

FERNANDA WILSON, PhD

ENVIRONMENTAL ENGINEER

HONORS

Women Engineers You Should Know, Society of Women Engineers, 2023

Michigan State Outstanding Graduate Student – Environmental Engineering, 2016

Winning paper at the 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies (Battelle), 2015

Phi Beta Delta International Honor Society, 2014

Several Traveling Grants from ESPP, The Graduate School, College of Engineering and Battelle, 2013–2014

Nordberg Fellowship from the Department of Civil Engineering, Michigan State University, 2010

Petrobras Technology Awards – Environmental Preservation Technology 1st place – Master Degree, 2009

DAAD (Deutscher Akademischer Austausch Dienst) – CNPQ Scholarship: Brazil-Germany Interchange, 2009

- Development of technical documents including SOPs, work plans, reports, permits, CMS, health and safety plans, landfill gas monitoring plans, and other documentation necessary for client compliance with regulatory agencies.
- Development of outreach technical documents including SERDP and NSF grants, ITRC fact sheets and technical regulation, presentations, abstracts, white paper, and peer reviewed articles.
- Presented various talks related to PFAS and chlorinated solvents. Latest include 2022 AIPG workshop, 2021 MI-AWWA webinar, 2019 Battelle Conference, and 2018 West Michigan Water and Wastewater Operators Workshop.

PUBLICATIONS

Andrea Vera, Fernanda Paes Wilson, Alison M Cupples. Predicted functional genes for the biodegradation of xenobiotics in groundwater and sediment at two contaminated naval sites. Appl Microbiol Biotechnol. 106(2):835-853 (2022).

Alison M. Cupples, Zheng Li, Fernanda Paes Wilson, Vidhya Ramalingam, Allison Kelly "In silico analysis of soil, sediment and groundwater microbial communities to predict biodegradation potential". Journal of Microbiological Methods, Volume 202, November 2022 106595

Kim Jinha, Mei Ran, Wilson Fernanda P., Yuan Heyang, Bocher Benjamin T. W., Liu Wen- Tso. Ecogenomics-Based Mass Balance Model Reveals the Effects of Fermentation Conditions on Microbial Activity. Frontiers in Microbiology 11, 3115 (2020).

Mei, R., Kim, J., Wilson, F.P. et al. Coupling growth kinetics modeling with machine learning reveals microbial immigration impacts and identifies key environmental parameters in a biological wastewater treatment process. Microbiome 7, 65 (2019).

Liu, Xikun; Wu, Yang; Paes, Fernanda; Yu, Ke; Lintner, Carly; Cupples, Alison; Mattes, Timothy. Integrated methodological approach reveals microbial diversity and functions in aerobic groundwater microcosms adapted to vinyl chloride. FEMS Microbiol Ecol. 2018 Sep 1;94(9).

Paes Wilson F., Liu, X., Mattes, T. E., and Cupples, A. M. 2016. Nocardioides, sediminibacterium, aquabacterium, variovorax, and pseudomonas linked to carbon uptake during aerobic vinyl chloride biodegradation. Environmental Science and Pollution Research. 23: 19062-19070.

Paes Wilson, F., and Cupples, A. M. 2016. Microbial community characterization and functional gene quantification in RDX degrading microcosms derived from sediment and groundwater at two naval sites. Applied Microbiology and Biotechnology, 100: 7297-7309.

Paes, F., Liu, X., Mattes, T. E., and Cupples, A. M. 2015. Elucidating carbon uptake from vinyl chloride using stable isotope probing and Illumina sequencing. Applied Microbiology and Biotechnology. 99: 7735-7743.

Rocha, L. L., Colares, G. B., Rodrigues Nogueira, V. L., Paes, F., and Melo, V. In press. Distinct habitats select particular bacterial communities in mangrove sediments. International Journal of Microbiology. 2016.

Paes, F., Hissa, D. C., Angelim, A. L., Pinto, N. W., Grangeiro, T. B., Vânia M M Melo. Diversity of a chlorine-resistant Bacillus population isolated from a wastewater treatment station. Water Environment Research 03/2012; 84(3):274-81.

Barreto, R. V. G., Hissa, D. C., Paes, F. A., Grangeiro, T. B., Nascimento, R. F., Rebelo, L. M., Craveiro, A. A., and Melo, V. M. M.. New approach for petroleum hydrocarbon degradation using bacterial spores entrapped in chitosan beads. Bioresource Technology 11/2009; 101(7):2121-5.

AARON BIGLER

ENVIRONMENTAL SCIENTIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Environmental Scientist
Envirologic Technologies, Inc.	2018-2023	Project Scientist
AKT Peerless Environmental Services	2017-2018	Senior Environmental Consultant
	2014-2017	Environmental Consultant
Global Environmental Engineering, Inc.	2013-2014	Environmental Scientist

PROFESSIONAL SUMMARY

Aaron is an environmental scientist for Fishbeck. In this capacity, he completes and manages a wide array of environmental due diligence projects for clients with a wide range of regulatory and private industry requirements, including Phase I and II ESAs, BEAs, and documentation of due care compliance (DDCCs). Aaron has extensive experience in conducting environmental due diligence projects with a multitude of stakeholders and regulatory agencies, including various local economic development organizations, land bank and Brownfield redevelopment authorities, EGLE's Remediation and Redevelopment Division, the Michigan State Housing Development Authority (MSHDA), and the USEPA. Aaron has also conducted extensive fieldwork for various environmental investigations, remediation projects, industrial hygiene applications, and UST/Leaking Underground Storage Tank (LUST) closures, including soil and groundwater sampling, sub-slab soil vapor and soil gas sampling, and indoor air sampling.

As an accredited Asbestos Inspector and Contractor/Supervisor, Aaron has managed and/or conducted over 1,400 inspections for both vacant and occupied residential, commercial, and industrial structures for asbestos-containing materials, as well as hazardous materials/universal wastes and construction materials reclamation. He has also assisted in oversight of several asbestos abatement, hazardous materials abatement, building demolition, and site restoration projects and worked closely with local units of governmental and regulatory agencies throughout these projects to insure compliance with these parties during these projects.

EXPERIENCE

- Conduct Phase I ESAs for a wide array of residential, commercial, and industrial properties.
- Research site-specific history, review public government agency files and risk assessment of nearby properties, and inspect the property to identify any current or historical environmental risks.
- Assist with Phase II ESAs by working with field/drilling team to manage site assessments, analyze and compare data to applicable cleanup criteria, and write technical reports to meet the present and future needs of present and future property owners/operators.
- Conduct groundwater, soil, sub-slab soil gas, soil vapor, and indoor air sampling for various elemental and anthropogenic contaminants.
- Complete asbestos-containing materials and hazardous materials/universal waste inspections for residential, commercial, and industrial properties.
- Compose industrial stormwater pollution prevention plans.

YEARS OF EXPERIENCE

5 years — Fishbeck
10 years — total

EDUCATION

BS in Environmental Science and Planning/Minor in Geographic Information Science, University of Michigan-Flint, 2012

REGISTRATIONS/ CERTIFICATIONS

EGLE Storm Water Management Industrial Sites (A-1i)

LEO MIOSHA Asbestos Program – Asbestos Inspector

LEO MIOSHA Asbestos Program – Asbestos Contractor/ Supervisor

2-Hour OSHA Lead Awareness Training

HAZWOPER Site Worker

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TODD CAMPBELL, CPG

SENIOR GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2000–present	Senior Geologist
APT, Ltd.	1995–2000	Geologist
AARES, Ltd	1994–1995	Geologist

PROFESSIONAL SUMMARY

Todd's environmental consulting and project management experience includes due diligence, aquifer pumping tests, slug tests, surveying, underground storage tank (UST) closures, Geoprobe® drilling, and soil logging utilizing the following drilling methods: Geoprobe®, hollow stem augers, sonic, and mud/air rotary. Todd has over two decades of experience in soil, groundwater, and soil gas sampling, and has assisted with both low-level sampling methods for mercury and PFAS.

His responsibilities include proposal generation, scheduling, field oversight, project management, Phase I and II ESAs, BEAs, documentation of due care compliance, Part 213 leaking UST projects, groundwater monitoring reports, response activity plans, hydrogeological investigations, site characterization, no further action reports (NFAs), restrictive covenants, health and safety plans, and proposals. He has also implemented *in-situ* injections, performed landfill monitoring, and reporting. Todd is a trained and practicing ground penetrating radar (GPR) operator.

Earlier in his career, Todd was a field geologist and conducted monitoring well installation, soil boring characterization, groundwater, and soil sampling, then operated a Geoprobe®. He has also conducted aquifer pump testing, baildown testing, slug testing, and UST removal oversight, sampling, and reporting.

EXPERIENCE

- Phase I and Phase II ESAs throughout United States.
- Baseline environmental assessments and due care plans.
- Site investigations of releases to soil and groundwater utilizing various drilling and direct push methodologies and techniques.
- Oversight of excavation/remediation projects.
- Extensive groundwater, surface water, and soil sampling experience using various methods.
- Performed and managed site investigations using incremental sampling methodology (ISM).
- Free phase product investigation and remediation including monitoring, recovery well installation, and free phase product recovery system installation.
- UST removal, soil sampling, initial and final assessment reporting, and closure report preparation.
- Oversight of water supply well installations and aquifer testing.
- Implementation of *in-situ* remediation projects including Fenton's reagent, potassium permanganate, and emulsified vegetable oil using direct push technologies and permanent treatment wells.
- Air sparge and soil vapor extraction (AS/SVE) system installation, monitoring, and operation and maintenance (O&M).
- Superfund Sites/CERCLA: long-term groundwater monitoring program, landfill cap inspections, institutional controls, operation, and maintenance activities.

YEARS OF EXPERIENCE

23 years — Fishbeck
29 years — total

EDUCATION

BS in Geophysics, Western Michigan University, 1994

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist – American Institute of Professional Geologists

Certified UST Professional

HAZWOPER Site Worker

HAZWOPER Supervisor

TAPPISAFE Basic Orientation

TAPPISAFE Graphic Packaging

MEMBERSHIPS

American Institute of Professional Geologists

National Groundwater Association

Portage Economic Development Corporation/Tax Increment Finance Authority and Brownfield Redevelopment Authority

TRAINING

The Groundwater Sampling Field Course, Nielsen Environmental Field School, Inc.

fishbeck

DAVID CONKLIN, PE

SENIOR WATER & WASTEWATER ENGINEER

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	1986–present	Senior Water/Wastewater Engineer
Dell Engineer	1982–1986	Staff Engineer

PROFESSIONAL SUMMARY

Dave is a senior project manager and design engineer and has managed and led design efforts on water and wastewater treatment facilities, water distribution systems, and remediation systems. He has also been involved with construction phase engineering and contract administration for many water/wastewater and environmental projects.

YEARS OF EXPERIENCE

37 years — Fishbeck
41 years — total

EDUCATION

BS in Civil Engineering,
Michigan State University, 1982

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer – Michigan

HAZWOPER Site Worker

Sandia National Laboratories – Risk Assessment Methodology for Water (RAM-W)

MEMBERSHIPS

American Society of Civil Engineers (Past President of the Western Michigan Branch)

American Water Works Association

Water Environment Federation

Michigan Water Environment Association

EXPERIENCE

OTT STORY CORDOVA SUPERFUND SITE | NORTH MUSKEGON, MICHIGAN

Fishbeck is under contract with the State of Michigan to operate the Ott Story groundwater treatment facility. The facility has been in operation for almost 30 years. Dave currently is the project manager and lead design engineer for several ongoing operational and design improvements for the facility.

ELECTRO-VOICE, INC. | BUCHANAN, MICHIGAN

Completed design construction documents and construction phase engineering for excavation of metal-contaminated soils and a 3-acre hazardous waste cap for a Superfund site. Design and certification of an RCRA cover system.

AKZO SALT | MANISTEE, MICHIGAN

Investigated chemical and geotechnical characteristics of 28,000 cubic yards of waste-stockpiled salt. Developed design specifications for excavation and disposal of stockpiled salt and related contaminated soils. Performed engineering services during closure.

PCA, INC. | FILER CITY, MICHIGAN

Prepared a closure plan for an existing 25-acre landfill and two sludge lagoons. The MDNR approved the closure, which involved using offsite ash from a cogeneration plant to solidify paper mill sludge in a 10-acre lagoon. The solidified material was placed on the adjacent landfill to establish proper slopes for capping the landfill with a synthetic liner system.

MOTOR WHEEL DISPOSAL SITE | LANSING, MICHIGAN

Evaluation and preliminary design of an RCRA cap for the unlined industrial waste disposal site.

BUTTERWORTH LANDFILL | GRAND RAPIDS, MICHIGAN

Evaluation of capping alternatives for CERCLA site.

BRADFORD WHITE CORPORATION | MIDDLEVILLE, MICHIGAN

Design and construction phase engineering for a groundwater purge and treat system, including a horizontal well collection system and a low-profile air stripping system.

STANDISH OIL COMPANY | HOUGHTON LAKE, MICHIGAN

Planning and design of groundwater purge and treatment system, SVE, and air sparging system for gasoline-contaminated groundwater. Prepared a complete RAP for submittal to regulatory agencies.

WURTSMITH AIR FORCE BASE | OSCODA, MICHIGAN

Involved in preparation of construction drawings and specifications for purge and treat system for benzene-contaminated groundwater. The treatment system included two air stripping towers for groundwater and catalytic oxidation for the resultant air stream.

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ZACH CURRY

GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Geologist
Envirologic Technologies, Inc.	2017–2023	Geologist

PROFESSIONAL SUMMARY

Zach is a geologist with Fishbeck in the Geosciences/Remediation Department. His responsibilities include providing various field services including Phase II ESAs and groundwater sampling for various contaminants, including PFAS. He oversees and manages the field aspects of UST removal and completes UST site assessments. He also oversees source removal activities (UST and other sources) including dewatering, excavation of contaminated soils, and remedial verification sampling.

Zach is one of Fishbeck's lead professionals for vapor intrusion investigation and mitigation. He performs soil gas/vapor sampling from both vapor wells, sub-slab, and ambient environments. He oversees the installation of various barrier systems and other vapor intrusion mitigation systems. He performs vapor intrusion risk evaluations including pressure field extension testing. He installs and performance tests vapor intrusion mitigation systems including operation, maintenance, and sampling.

While at Envirologic, Zach Conduct Phase I ESAs for residential, commercial, and industrial properties using ASTM standards to determine environmental conditions of property for real estate and financing activities. He performed site-specific historic research, reviewed public government agency files, risk assessment of nearby properties, and inspected properties to identify any current or historical environmental risks. He followed up the Phase I with Phase II ESAs where he worked with field/drilling teams to manage site assessments. He analyzed data, and compared it to applicable cleanup criteria; and wrote technical reports. He prepared BEAs and documentation of due care compliance for the transfer of contaminated property. He also developed and implemented USEPA sampling and analysis plans for Brownfield redevelopment projects.

EXPERIENCE

- Conduct Phase I ESAs for residential, commercial, and industrial properties using ASTM standards to determine environmental conditions of property for real estate and financing activities.
- Perform site-specific historic research, review public government agency files, risk assessment of nearby properties, and inspect properties to identify any current or historical environmental risks.
- Conduct Phase II ESAs. Work with field/drilling team to manage site assessments, analyze data, and compare to applicable cleanup criteria; and write technical reports.
- Prepare BEAs and documentation of due care compliance for the transfer of contaminated property.
- Develop and implement USEPA sampling and analysis plans for Brownfield redevelopment projects.
- Employ drilling techniques (e.g., hollow-stem auger, hand auger, geoprobe, mud and air rotary, sonic drill rig) for site investigations.
- Preform groundwater sampling and monitoring including low-flow and PFAS sampling.
- Oversee UST removals and complete UST site assessments. Oversee source removal activities including dewatering, excavation of contaminated soils, and remedial verification sampling.

YEARS OF EXPERIENCE

5 years — Fishbeck
5 years — total

EDUCATION

BS in Geology,
Grand Valley State University,
2015

Precambrian Research
Field Camp, University
of Minnesota-Duluth

REGISTRATIONS/ CERTIFICATIONS

HAZWOPER Site Worker

Land Science™ Certified
Vapor Barrier Inspector

MEMBERSHIPS

American Institute
of Professional Geologists

TRAINING

ASTM RBCA Training

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ZACH CURRY

GEOLOGIST

- Conduct professional oversight for installation of various Land Science™ vapor barrier systems and other vapor intrusion mitigation systems.
- Perform vapor intrusion risk evaluations including soil gas sample collection and pressure field extension testing.
- Conduct vapor intrusion mitigation system installation, operation, maintenance, and sampling.
- Perform soil, groundwater, and soil gas sample collection.

ALI DAHLBACKA

ENVIRONMENTAL ENGINEER

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2015–present	Environmental Engineer

PROFESSIONAL SUMMARY

Ali is an environmental engineer in the GeoSciences/Remediation Department at Fishbeck. In this capacity, her responsibilities include an array of engineering and project management activities. Ali has worked on numerous environmental investigation and remediation projects, both in the office and in the field. She has experience with the design, operation, monitoring, and management of soil vapor extraction (SVE) systems, vapor mitigation systems, and enhanced reductive dechlorination (ERD) projects, as well as data interpretation, reporting, and proposal and work plan preparation, primarily at sites impacted with chlorinated solvents. In her role as a project manager, Ali is responsible for client communications, budget control, invoicing, authorization preparation, scheduling, and sampling coordination. In 2019, Ali became project manager for removal action activities at the Pools Prairie Superfund Site Manufacturing Plant Area in southwest Missouri, for which she is currently preparing a Final Removal Action Report. In addition to project management tasks, she oversaw the operation of three SVE blower systems between 2015 and 2021, using operating and performance data to optimize system operation (i.e., maximize contaminant removal). Following completion of SVE treatment in each of the target area, Ali prepared closure memoranda for U.S. Environmental Protection Agency approval. Ali currently manages three other remediation projects, including the former Howell Penncraft Facility in Howell, Michigan. Interim response actions implemented at the site to reduce the mass of chlorinated volatile organic compounds in soil and groundwater include ERD, excavation, and SVE. Ali's field experience includes air, soil vapor, soil, groundwater, and waste characterization sampling; well and soil boring installation; construction oversight for remedial projects; and ERD implementation.

EXPERIENCE

- Implementation of *in situ* remediation projects including the injection of emulsified vegetable oil and zero valent iron using both direct push technology and permanent injection/extraction wells.
- Low-flow groundwater sampling for remedial investigations and performance monitoring.
- Performed site investigations using incremental sampling methodology to estimate mean contaminant concentrations.
- Vapor Pin® installation and sampling.
- Sub-slab soil gas and indoor air monitoring to evaluate the vapor intrusion pathway.
- Vapor intrusion assessment and mitigation system design, installation, and operation including pressure field extension testing and data evaluation.
- SVE system design, installation, performance monitoring, operation and maintenance, reporting, and project management.
- Operation and maintenance of a mitigation system installed to control methane generated as a by-product of ERD in underlying groundwater.
- Collection, tabularization, management, and reporting of SVE and bioventing system field data.
- Collection, tabularization, management, and reporting of groundwater ERD performance monitoring data.
- Assessment of ERD performance and natural attenuation monitoring data.
- Development of a monitored natural attenuation remedial strategy.

YEARS OF EXPERIENCE

7 years — Fishbeck
7 years — total

EDUCATION

BS in Environmental Engineering, Michigan Technological University, 2014

REGISTRATIONS/ CERTIFICATIONS

Engineer-in-Training – Michigan

OSHA 40-hour HAZWOPER

TRAINING

RemTEC Summit – 2019, 2021

2022 Chlorinated Conference

4-hour Confined Space Entry

Hurley Write Inc. Courses – Proposal Writing, Technical Writing

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ALI DAHLBACKA

ENVIRONMENTAL ENGINEER

- Perform reviews of technical work (e.g., proposals, reports, presentations, and data analyses).

PRESENTATIONS/PUBLICATIONS

Co-presenter, Vapor Intrusion: What is Seeping into the Workplace? Western Michigan Industrial Hygiene Society Webinar, 2021.

Presenter (poster), Remediation of Chlorinated Solvents in Harsh Environments: Enhanced Reductive Dechlorination in a Low pH, High Dissolved Oxygen Concentration Surficial Aquifer, Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, 2022.

YEARS OF EXPERIENCE
35 years — Fishbeck
37 years — total

EDUCATION
MS in Environmental Engineering, Michigan State University, 1992

BS in Industrial Chemistry and Natural Resources Management, Grand Valley State University, 1982

REGISTRATIONS/ CERTIFICATIONS
Certified Hazardous Materials Manager

HAZWOPER Site Worker

MEMBERSHIPS
Michigan Water Environment Association

Water Environment Federation

West Michigan Soil Erosion Control Network

Institute of Hazardous Materials Management

AWARDS
Industrial Waste Professional of the Year, Michigan Water Environment Association, 2009

Outstanding Environmental Consultant of the Year, Michigan Water Environment Association, 2022

fishbeck

DAVID FILIPIAK, CHMM

ENVIRONMENTAL ENGINEER | ENVIRONMENTAL CHEMIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	1987–present	Environmental Engineer/Chemist

PROFESSIONAL SUMMARY

Dave has environmental engineering experience with a variety of projects and clients. His responsibilities have focused on industrial and municipal wastewater treatment and groundwater remediation techniques. He has worked extensively with dairy, fruit, and vegetable clients in the food processing industry to develop and implement wastewater management and engineering solutions. Along with the food processing industry, he has developed and implemented wastewater treatment systems for clients in the metal finishing, chemical manufacturing, and paper industries. He has been responsible for desktop evaluations, bench- and pilot-scale testing, full-scale process selection, equipment selection, and treatment system operations. Dave has negotiated discharge permits with state and municipal regulatory agencies for NPDES, State of Michigan groundwater discharge, and IPP dischargers. His experience includes a strong background in collection and interpretation of environmental data for characterization of various wastewater streams, surface water, and groundwater. This experience includes analytical method selection, laboratory data validation, and interpretation of environmental of data for compliance monitoring and site investigations.

Dave has been involved in numerous site contamination remedial investigation and feasibility studies. The outcome of these studies was selection and implementation of remedial technologies for cleanup of contaminated groundwater and soil. He has acted as project manager and primary client contact regarding regulatory compliance on several wastewater treatment and groundwater remediation projects.

Specific treatment techniques, both evaluated and implemented, include aerobic and anaerobic biological processes and physical/chemical to treat municipal and industrial wastewaters; natural attenuation of organics and inorganics in soil and groundwater; and removal of heavy metals, cyanide, and oil and grease from industrial wastewaters.

As a CHMM, Dave is familiar with regulatory requirements for handling, treating, and disposing of hazardous and potentially hazardous materials for industrial and municipal clients.

EXPERIENCE

INGHAM COUNTY, MICHIGAN
TOLLGATE WETLANDS
Evaluated the effectiveness of a gravel wetland filter for removing urban stormwater pollutants including heavy metals, oils and grease, and nutrients. Applied an understanding of chemical and biological processes for pollutant removal to aid in filter design and develop a long-term monitoring program.

GRAND VALLEY METRO COUNCIL | GRAND RAPIDS, MICHIGAN
Developed and implemented the QAPP for E. coli monitoring in Buck and Plaster Creeks and in the Coldwater River as part of the Lower Grand River Watershed Council. Performed onsite field staff training and was the project QA officer.

ALLEGAN COUNTY CONSERVATION DISTRICT, MICHIGAN
Developed and implemented the QAPP for nutrient monitoring in the Gun River, which focused on TSS and phosphorus monitoring to estimate nutrient loadings to the Kalamazoo River. Performed onsite field staff training and acted as the project QA officer.

DAVID FILIPIAK, CHMM

ENVIRONMENTAL ENGINEER | ENVIRONMENTAL CHEMIST

MUSKEGON RIVER WATERSHED ASSEMBLY | MUSKEGON COUNTY, MICHIGAN

Developed and implemented the QAPP to estimate sediment migration in Cedar Creek and select tributaries. This project involved in-stream sampling of bed load and establishment of stream flows. A long-term flow monitoring program was implemented as part of this project to correlate sediment transport to stream stage.

LAKEWOOD WASTEWATER AUTHORITY, MICHIGAN

System start-up for a municipal wastewater treatment system that receives approximately 80% of its waste loading from three major food processing operations discharging to this system. Negotiated Industrial User Permits issued to the major users in compliance with State standards and rated capacity of the plant. Implemented plant operations strategies to maintain discharge permit compliance

CITY OF MACKINAC ISLAND, MICHIGAN

Treatment capacity evaluation for the municipal wastewater treatment system at one of the largest seasonal tourist attractions in Michigan. The City's wastewater treatment system undergoes a tenfold increase in flow and load on an annual basis during the summer tourist season. Dave works annually with the treatment system operators to ensure performance and compliance with discharge permit requirements during seasonal increases and decreases in flows and loadings

CITY OF LUDINGTON, MICHIGAN

Developed and implemented updates to modify an aerated lagoon-based treatment system to an extended aeration activated sludge system. Ludington's plant receives over half of its load from one industrial discharger. Worked with the City to establish limits on the major industrial user to keep this important business in the City while ensuring continuous compliance with the City's NPDES permit. Managed the RI/FS for groundwater impacts related to the former lagoon-based system.

MICHIGAN MILK PRODUCERS ASSOCIATION | OVID, MICHIGAN

Wastewater treatment system evaluation, design, construction, and operation at a milk balancing plant with the capacity to process up to five million pounds of milk per day. The plant's original process wastewater treatment was composed of an outdated land application system that needed replacement. The implemented solution included activated sludge treatment using SBR technology that incorporated biological and chemical nutrient control followed by surface water discharge. Managed regulatory negotiations under and Administrative Consent Order for the closure and RI/FS of the former land application site under Michigan Part 201 requirements and establishing new system NPDES discharge limits. This treatment system has undergone three major upgrades since initial start-up in 2003 with Fishbeck acting as the designer and construction manager for each.

GRACELAND FRUIT, INC. | FRANKFORT, MICHIGAN

Developed an updated process wastewater treatment system for a major dried fruit producer. Due to the plant's location near a highly protected trout stream, treatment followed by surface water discharge was not feasible. Treatment followed by groundwater discharge using rapid infiltration basins was selected. The treatment system evaluation resulted in selection and implementation of a combined anaerobic and aerobic biological process to treat the high-strength, carbohydrate-rich wastewater. Groundwater discharge requires an effluent low in residual oxygen demand, nitrogen, and phosphorus. Dave managed the groundwater RI/FS required for closure of the former spray irrigation fields which were in service for 20 years prior to a new system.

CONFIDENTIAL NUTRITIONAL FORMULA MANUFACTURER, MICHIGAN

Developed process sizing, equipment selection and start-up for a 0.9 MGD process wastewater system that Fishbeck acted as the design builder for. Worked with the owners management team to develop and implement an activated sludge based system which incorporated raw wastewater

DAVID FILIPIAK, CHMM

ENVIRONMENTAL ENGINEER | ENVIRONMENTAL CHEMIST

equalization, a two tank SBR based treatment system, and treatment residuals digestion and storage. Acted as lead process engineer for the project and was heavily involved in system prove out and new operator training. The system discharges to the local municipality and has consistently met permit limits since commissioning.

BAILEY HANNAH

HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2019–present	Staff Hydrogeologist

PROFESSIONAL SUMMARY

Bailey is a staff hydrogeologist at Fishbeck. She has experience in environmental remediation, hydrogeology, and groundwater surface water interactions. In her capacity as a staff hydrogeologist, she focuses on hydrogeological and remedial investigations, groundwater flow and transport models, and performance of soil and groundwater sampling, and drilling oversight. She has been involved with many projects for various municipalities and private clients during her time with Fishbeck. She has spent significant time in the field, conducting *in situ* sampling and monitoring of groundwater, soil, and air. She also has experience overseeing a variety of drilling operations, including direct push, hollow stem auger, cable tool, mud rotary, and air rotary. In 2021, Bailey became a project manager. She currently manages four projects, including a remediation project involving a former MAHLE manufacturing site in Muskegon, Michigan. The site was previously remediated for hexavalent chromium and is currently undergoing a PFAS investigation via vertical aquifer profiling and plume mapping. Bailey has worked on a litany of other remediation projects, both in the office and the field. These have exposed her to ERD treatment systems, SVE treatment systems, excavations, exposure barriers, and the data analysis and investigation associated with each.

In 2017, Bailey began her masters program in the hydrogeology laboratory at Michigan State University. Her master's thesis centered around statistically modeling the relationship between landscape scale factors, such as contaminant loading, to the plant species comprising the Great Lakes coastal wetlands, and building a coded numerical model to assess contaminant transport in the Manistee and Au Sable river basins. Her areas of expertise include data analysis via ArcGIS, ground and surface water interactions, and groundwater monitoring.

EXPERIENCE

- Manage four environmental projects throughout the state of Michigan, and manage the geosciences portion of three other projects.
- Perform traditional environmental sampling techniques, such as groundwater, surface water, soil, air, and soil vapor sampling.
- Oversee the use of several varieties of drilling methods, such as direct push, hollow stem auger, cable tool, bucket auger, air rotary, and mud rotary.
- Generate analytical and numerical groundwater flow and transport models.
- Author and review technical reports and proposals.
- Perform sampling and removal oversight at UST sites.
- Managed the installation and design of drinking water supply wells for three communities.
- Further the hydrogeologic understanding of various sites using techniques such as aquifer testing, slug testing, or groundwater modeling

PUBLICATIONS/PRESENTATIONS

Hannah, B., Kendall, A., Martin, S., and Hyndman, D. "Quantifying Linkages between Watershed Factors and Coastal Wetland Plant Invasion in the US Great Lakes," Published in the Journal of Landscape Ecology, September 2020.

Hannah, B. "Understanding Environmental Consulting," Talk at Western Michigan University, Kalamazoo, Michigan March 21, 2023.

YEARS OF EXPERIENCE

4 years — Fishbeck
4 years — total

EDUCATION

MS in Environmental Geosciences, Michigan State University, 2022

BS in Environmental Science and Sustainability, Michigan State University, 2017

REGISTRATIONS/ CERTIFICATIONS

HAZWOPER Site Worker

MEMBERSHIPS

National Groundwater Association

Air and Waste Management Association/West Michigan

MiCAMP

American Water Works Association

American Institute of Professional Geologists

TRAINING

Pumping Tests for Aquifer Evaluation, Midwest GeoSciences

Intro to ArcGIS, ESRI

ArcGIS in Ecology, Michigan State University

fishbeck

BAILEY HANNAH

HYDROGEOLOGIST

TRAINING (CONTINUED)

Groundwater Modeling, Michigan State University

Intro to Python, Python

Certified Miner

Mine Safety

Health Administration Parts 46 and 48

Hannah, B. "Understanding Environmental Consulting," Talk at Calvin University, Grand Rapids, Michigan February 8, 2023.Hannah, B., Kendall, A., Martin, S., and Hyndman, D. "Connecting Watershed-Scale Factors to Invasion within the Coastal Wetlands of the Great Lakes Basin," Talk at the American Geophysical Union, Washington D.C., December 2018.

JOEL HENRY

SENIOR HYDROGEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Senior Hydrogeologist
Golder/WSP	2012–2023	Senior Hydrogeologist
Malcolm Pirnie/Arcadis	1999–2012	Project Hydrogeologist
EA Engineering, Science, and Technology	1995–1999	Staff Hydrogeologist

PROFESSIONAL SUMMARY

Joel is a senior hydrogeologist with 27 years of experience as an environmental consultant. His primary areas of experience are the remedial investigations of contaminated groundwater and the development of sustainable groundwater supplies. He has performed water supply planning and siting studies for energy, municipal, and beverage clients. His technical specialties include conceptual model development, aqueous geochemistry, emerging contaminants, water risk management, competing water use evaluations for large quantity water users, and the design and construction of high-capacity wells.

Since coming to Fishbeck a year ago, Joel has been a project manager, team lead, and/or senior reviewer for groundwater contamination sites, water supply development projects, and hydrogeologic characterization for aggregate and natural resource projects. He is a detailed project manager, designing and overseeing investigations, while handling budgets, deliverables, and staff development. He has prepared four permits for temporary and permanent groundwater withdrawals and is a technical advisor to the State of Michigan Water Use Advisory Council. He is a team lead for Fishbeck's sustainability initiative, advocating for the adoption of sustainable goals into project metrics.

While at Golder (acquired by WSP in 2021), Joel led water supply development projects in Michigan for Consumers Energy and Nestle Waters North America. Joel managed the characterization and remediation of perchlorate at the City of Evart, Michigan wellfield, identifying its source as the July 4th fireworks launched annually from the County Fairgrounds. The project won the National Ground Water Association's 2020 Outstanding Groundwater Remediation Project Award. Joel also worked on water supply developments for the Copperwood mine near Ironwood, and the Jackson Generating Station in Jackson, Michigan.

At Malcolm Pirnie (acquired by Arcadis in 2006), Joel worked on four of the five State of Michigan Level of Effort (LOE) contracts, as field geologist or task manager and dozens of Part 201 and Part 213 sites throughout the state. Some of the more significant projects included the Ottawa Steel and ASP Plating CVOC plumes in Grand Haven; Residential Well contamination in Brighton and Tekonsha; the abandoned Brighton Township Dump; the Satterlee-Sumpter Landfill; tar pits in Jennings, Filer Township, and Cadillac; USTs at MDNR boat docks in DeTour and East Tawas; and Bob's Marathon in Grand Ledge.

Joel worked for EA Engineering in Syracuse, NY for three years supporting the U.S. Army Corps of Engineers (USACE) at active Department of Defense facilities including the 10th Mountain Division at Fort Drum, NY; the Lake Ontario Ordinance Works in Niagara Falls, NY; a former NIKE missile base in Davisville, RI; and the Naval Undersea Warfare Center in New London, CT.

EXPERIENCE

- Management and site investigation experience for State government, USACE, and DOD.
- Environmental consulting for industry clients in food and beverage, and energy industries.

YEARS OF EXPERIENCE

27 years — total

EDUCATION

MS Geologic Sciences,
Michigan State University, 1995

MS Science Education,
Syracuse University, 1991

BS Chemistry,
Bucknell University, 1988

REGISTRATIONS/ CERTIFICATIONS

OSHA 10-Hour Construction

HAZWOPER

Asbestos Awareness

MEMBERSHIPS

Michigan Water Use Advisory Committee, Technical Advisor

National Ground Water Association

fishbeck

JOEL HENRY

SENIOR HYDROGEOLOGIST

- Perform technical reviews of proposals and technical documents.
- Hydrogeologic characterization of sites for remediation or for water supply development.
- Contractor oversight and management.
- Operation and maintenance of treatment systems.

BRADLEY PEULER, CPG

SENIOR GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2012–present	Project Manager
	2000–2012	Field Geologist

PROFESSIONAL SUMMARY

Brad is a senior geologist in the GeoSciences/Remediation department at Fishbeck. In this capacity, he serves as project geologist and project manager on various environmental and remediation projects. Brad co-manages numerous large-scale projects where he serves as the administrative project manager and is responsible for budget control, invoicing, authorization preparation, scheduling, sampling coordination, and reporting.

His environmental consulting and project management experience includes data interpretation, work plan preparation, UST closures, no further action reports, groundwater monitoring reports, RAPs, restrictive covenants, hydrogeological reports, and proposal writing. Brad's field experience includes various site investigation and remediation activities, monitoring and production well installations, groundwater sampling, verification of soil remediation sampling, surface water sampling, and soil sampling. He also has field experience related to implementing *in-situ* remediation projects and remedial systems.

EXPERIENCE

- Site investigations of releases to soil and groundwater utilizing various drilling and direct push methodologies and techniques.
- Oversight of excavation/remediation projects.
- Extensive groundwater, surface water, and soil sampling experience using various methods.
- Performed and managed site investigations using incremental sampling methodology (ISM).
- Free phase product investigation and remediation including monitoring, recovery well installation, and free phase product recovery system installation.
- UST removal, soil sampling, initial and final assessment reporting, and closure report preparation.
- Oversight of water supply well installations and aquifer testing.
- Implementation of *in-situ* remediation projects including Fenton's reagent, potassium permanganate, and emulsified vegetable oil using direct push technologies and permanent treatment wells.
- Air sparge and soil vapor extraction (AS/SVE) system installation, monitoring, and operation and maintenance (O&M).
- Superfund Sites/CERCLA: long-term groundwater monitoring program, landfill cap inspections, institutional controls, operation, and maintenance activities.
- Project manager for ongoing RCRA corrective actions, site spill investigations and remediation, and groundwater monitoring.
- Data review and interpretation including Mann-Kendall concentration trend analysis.
- Preparation of no further action and closure reports, including restrictive covenants.

YEARS OF EXPERIENCE

22 years — Fishbeck

22 years — total

EDUCATION

BS in Geology, Hope College, 1999

REGISTRATIONS/ CERTIFICATIONS

Certified Professional Geologist, American Institute of Professional Geologists – Michigan

HAZWOPER Site Worker

MEMBERSHIPS

American Institute of Professional Geologists

TRAINING

Groundwater Sampling Field Course, Nielson Environmental Field School, Inc.

fishbeck

KAYLA ROONEY

GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Geologist
Envirologic Technologies, Inc.	2020–2023	Field Geologist

PROFESSIONAL SUMMARY

Kayla is a geologist with Fishbeck. Her role is to support various hydrogeological and contaminant investigations and assist with remedial implementation, both in a field and office setting. She has field experience with various drilling and well installation methods, remediation technologies, aquifer testing, installation of vapor mitigations systems, and sampling in support of vapor intrusion studies and contaminant delineation in various media. Kayla assists with managing several Part 213 sites, inclusive of implementing various phases of investigation and report writing. She also has experience working on Part 201 sites, most recently conducting a pore water/stream flow investigation and statistical analysis of groundwater data for the former DTE Harbor Beach Power Plant. She has played an integral role in several scopes of work (well installation coordination/oversight, sewer vapor assessment, ZVI injection oversight, etc.) associated with a former solvent recovery facility in Michigan where work is overseen by the EPA.

EXPERIENCE

- Field experience related to sampling, remediation, drilling and well installation, aquifer testing, and vapor mitigation systems.
- Oversees monitoring well installation projects.
- Oversees remedial activities (e.g., excavation, ZVI injection) as well as the installation and O&M of vapor mitigation systems.
- Low-flow groundwater sampling techniques for remedial investigation projects.
- Conducts analyses of soil/sediment cores.
- Understanding of ArcGIS, PHREEQC, AQTESOLV, and Surfer15.
- Managed and/or assisted on multiple projects for EGLE and the DNR, related to state inspections, GIS mapping, and data collection.

PRESENTATIONS/PUBLICATIONS

Lingle, D. A. and Rooney, K. M.; ZVI application to till via environmental fracturing. AIPG Michigan Section Technical Workshop, Roscommon, Michigan, June 13, 2023 (future).

YEARS OF EXPERIENCE

3 years — Fishbeck
3 years — total

EDUCATION

BS in Geology/ Environmental Emphasis, Grand Valley State University, 2019

Hydrogeology Field Course, Western Michigan University, 2019

Bachelor of Fine Arts in Photography, Kendall College of Art & Design, 2014

REGISTRATIONS/ CERTIFICATIONS

HAZWOPER Site Worker

EGLE Storm Water Management – Industrial Site (A1i)

TRAINING

ASTM RBCA at Petroleum Release Sites

fishbeck

THERESE SEARLES

SENIOR GEOLOGIST

PROFESSIONAL EXPERIENCE

Employer	Years Worked	Title
Fishbeck	2023–present	Senior Geologist
Envirologic Technologies, Inc.	2019–2023	Brownfield Project Manager
	2016–2019	Project Scientist
Analytical Testing and Consulting Services (ATCS)	2010–2011	Industrial Hygiene Technician
	1998–2002	Industrial Hygiene Technician

PROFESSIONAL SUMMARY

At Fishbeck, Therese is a Brownfield redevelopment specialist. Her role as a project manager includes preparation of Brownfield plans, Act 381 work plans, tax increment tracking systems, and USEPA assessment grant reporting requirements. She manages and conducts environmental due diligence, including Phase I and II ESAs, BEAs, and due care evaluations; air monitoring, asbestos surveys, and abatement oversight. She is a certified as a lead inspector and lead risk assessor. Therese is also conducts radon assessments.

As a project manager with Envirologic, her responsibilities expanded to include project oversight in the Brownfield Redevelopment Services Group. She managed both external (client) and internal (project team) communications vital to the success of this position. She worked on the management and implementation of Act 381 work plans, Brownfield plans, and tax increment financing tools. Additionally, she supported clients by applying for and managing various grant and loan opportunities, including EPA grants, ELGE grants and loans, MSHDA/HUD, and others. Therese also implemented community outreach and public presentations.

As a project scientist with Envirologic, she worked with government entities and private industries to conduct Phase I and II ESAs, documentation of due care compliance, and baseline environmental site assessments on a wide range of sites, from urban industrial to rural agricultural. In addition, as a Certified Lead Inspector and Risk Assessor, she conducted onsite investigations to determine the existence, nature, severity, and location of lead-based paint hazards.

At ATCS, Therese was responsible for the following: project management, designing/implementing training programs, performing air monitoring for asbestos removal projects, analyzing asbestos air samples using NIOSH 7400 method, performing asbestos surveys/inspections, training instructor for various lead-based paint training programs, performing lead risk assessments, IAQ studies, health and safety, generating reports, performing air monitoring for asbestos removal projects, and Phase I site assessments.

EXPERIENCE

- Manage Brownfield redevelopment including preparation of Brownfield plans and Act 381 work plans, working with Brownfield redevelopment authorities and developers, assessing funding resources, reimbursement tracking and implementation, EGLE/USEPA grant and loan administration and implementation, and community relations.
- Work with Brownfield authorities, local governmental units, and developers.
- Conduct Phase I ESAs for residential, commercial, and industrial properties.
- Conduct site-specific historic research, review public government agency files, perform risk assessment of nearby properties, and inspect properties to identify any current or historical environmental risks.
- Assist with Phase II ESAs. Work with field/drilling team to manage site assessments, analyze data, and compare to applicable cleanup criteria; and write technical reports.

YEARS OF EXPERIENCE

6 years — Fishbeck

12 years — total

EDUCATION

BS in Geology and Environmental Studies, Western Michigan University, 2016

REGISTRATIONS/ CERTIFICATIONS

HAZWOPER Site Worker

Accredited Asbestos Inspector

Asbestos Contractor Supervisor

Lead Inspector

Lead Risk Assessor

NIOSH 582 Certified

TRAINING

NITON XRF Spectrum Analyzer Training

NRPP Residential Measurement Provider for Radon

fishbeck

THERESE SEARLES

SENIOR GEOLOGIST

- Perform BEAs/due care plans. Write technical reports to provide liability protection for clients' recently purchased properties and provide due care documentation of client responsibility to protect the public from any unacceptable health exposures.
- Complete Part 213 leaking UST investigations, remedial activities, and compliance report preparation.
- Design and implement ambient air exposure monitoring at construction sites.
- Conduct construction site soil management and characterization.
- Complete abandoned container characterization and evaluation for due care compliance.
- Perform asbestos inspections.
- Complete air monitoring and oversight for asbestos removal projects.
- Analyze asbestos air samples using NIOSH 7400 method.
- Perform lead inspections and risk assessments.
- Train individuals for various lead-based training programs.
- Conduct radon monitoring and reporting.

QC Documentation - Environmental Division Work Product

Section 1

Project Number:

Project Name:

Project Manager

Document Title

Section 2 — *Document type*

Report/Letter ☐ Permit ☐ Proposal ☐

Work Plan/QAPP ☐ HASP ☐ Other ☐ _____

Section 3 — *Check items included for review:*

Draft text ☐ Appendices ☐ Supporting documentation ☐

Figures ☐ Field Notes (QC-reviewed) ☐

Tables ☐ Other ☐ _____

Section 4 — *Text Technical Review (INTERNAL)*

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 5 — *Figures Review (INTERNAL)*

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 6 — *Tables Review (INTERNAL)*

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 7 — *Appendices Review (INTERNAL)*

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 8 — *Review Draft Technical Edits Addressed (if applicable)*

Completed by: _____

Completed on: _____

Section 9 — *Admin Review Draft Preparation/Proofing (if applicable)*

Admin: _____

Date: _____

Section 10 — *PM Review Draft Approval (if applicable)*

PM Signature: _____

Date: _____

Section 11 — *Client Review Draft Tech Revisions/Edits (if applicable)*

Edits required: ☐ yes ☐ no

Section 12 — *Final Technical Revisions/Edits*

Completed by: _____

Completed on: _____

Section 13 — *Admin Final Report Preparation/Proofing*

Admin: _____

Date: _____

Section 14 — *Final Document Approval*

PM Signature: _____ Date: _____

APPENDIX 3

CERTIFICATION FORMS

(See pages 92 - 95 of contract)

APPENDIX 4

OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

The following instructions are to be used by the Professional Services Contractor firms to determine the hourly billing rate to use on State of Michigan Projects.

The Professional's Consultant must submit a separate hourly billing rate for the professional consultant services they will provide for State of Michigan Projects. A moderate mark-up of the Professional's Consultant services hourly billing rates will be allowed.

The Department will reimburse the Professional for the actual cost of printing and reproduction of the Contract Bidding Documents, soil borings, surveys and any required laboratory testing services and use of field equipment. **No mark-up of these Project costs will be allowed if services are performed in house.**

2023 HOURLY BILLING RATE
Based on 2022 Expenses

OVERHEAD ITEMS ALLOWED FOR THE PROFESSIONAL SERVICES CONTRACTOR FIRM'S HOURLY BILLING RATE CALCULATION

SALARIES:	**EMPLOYEE BENEFITS:**	**INSURANCE:**
Principals (Not Project Related)	Hospitalization	Professional Liability Insurance
Clerical / Secretarial	Employer's Federal Insurance Contributions Act (FICA)Tax	Flight and Commercial Vehicle
Technical (Not Project Related)	Unemployment Insurance	Valuable Papers
Temporary Help Tax	Federal Unemployment	Office Liability
Technical Training	Disability	Office Theft
Recruiting Expenses	Worker's Compensation	Premises Insurance
	Vacation	Key – Personnel Insurance
	Holidays	Professional Liability Insurance
	Sick Pay	
	Medical Payments	
	Pension Funds	
	Insurance - Life	
	Retirement Plans	

TAXES:	**SERVICES (PROFESSIONAL)**	**EQUIPMENT RENTALS:**
Franchise Taxes	Accounting	Computers
Occupancy Tax	Legal	Typewriter
Unincorporated Business Tax	Employment Fees	Bookkeeping
Single Business Tax	Computer Services Bond)	Dictating
Property Tax	Research	Printing
Income Tax	Project / Contract Bond	Furniture and Fixtures
		Instruments

OFFICE FACILITIES:

Rents and Related Expenses
Utilities
Cleaning and Repair

LOSSES:

Bad Debts (net)

Uncollectible Fee
Thefts (not covered by Project / Contract)
Forgeries (not covered by Project / Contract)

FINANCIAL:

Depreciation

SUPPLIES:

Postage

Drafting Room Supplies

General Office Supplies
Library
Maps and Charts
Magazine Subscriptions

PRINTING AND DUPLICATION:

Specifications (other than Contract Bidding documents)
Drawings (other than Contract Bidding documents)
Xerox / Reproduction
Photographs

SERVICES (NONPROFESSIONAL):

Telephone and Telegram

Messenger Services

TRAVEL:

All Project – Related Travel*

MISCELLANEOUS:

Professional Organization Dues for Principals and Employees
Licensing Fees

III-2-A. Position, Classification and Employee Billing Rate Information

Firm Name **XYZ, Inc.**

Yearly Hourly Billing Rate Increase **≈4%**

Position/Classification	Year 2023	Year 2024	Year 2025	Year 2026
Principal/Project Manager**	$100.00	$105.00	$110.00	$116.00
Senior Architect	$100.00	$105.00	$110.00	$116.00
Quality Control/Assurance	$100.00	$105.00	$110.00	$116.00
Licensed Surveyor**	$90.00	$95.00	$99.00	$104.00
Project Engineer**	$90.00	$95.00	$99.00	$104.00
Mechanical Engineer**	$90.00	$95.00	$99.00	$104.00
Sr. Structural Engineer	$80.00	$84.00	$88.00	$92.00
Electrical Engineer	$80.00	$84.00	$88.00	$92.00
Scientist/Surveyor	$65.00	$68.00	$71.00	$75.00
Staff Engineer	$65.00	$68.00	$71.00	$75.00
Staff geologist	$65.00	$68.00	$71.00	$75.00
CAD Operator	$75.00	$79.00	$83.00	$87.00
Technician	$65.00	$68.00	$71.00	$75.00
Field Technician	$50.00	$53.00	$56.00	$59.00
Technical Support	$35.00	$37.00	$39.00	$41.00

*Billing Rate will be in accordance with the attached guideline page for instructions regarding the "Overhead Items used for Professional Billing Rate Calculation," and the "Sample Standard Contract for Professional Services," Article 5, Compensation Text.

** Key Project Personnel

III-2-B. Fee with Anticipated Hours and Billing Rate

	POSITION/ CLASSIFICATION	TOTAL HOURS	BILLING RATE	TOTAL
	Principal/Project Manager	30	100.00	3,000.00
	Senior Architect	17	100.00	1,700.00
	Licensed Surveyor	9	90.00	810.00
	Project Engineer	8	90.00	720.00
	Mech. Engineer.	8	90.00	720.00
	Sr. Structural Engineer	8	80.00	640.00
	Electrical Engineer	22	80.00	1,760.00
	Draftsperson	40	35.00	1,400.00
	Quality Control	2	100.00	200.00
	CAD Operator	42	35.00	1,470.00
	SUBTOTAL	186		$10,667.50

III-2C. Authorized Reimbursables -- Sub-consultants, Testing and Expenses

***Firm's Mark-Up Percentage:_____**

PHASE	NAME OF FIRM	DESCRIPTION OF SERVICES PROVIDED	TOTAL AMOUNT* (Including mark-up)
Phase 400	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
Phase 500	XYZ Productions, Inc. Lansing, Michigan	Printing and reproduction of bidding documents	500.00
Phase 500	Forrest T. Arrea, Landscape Architect, Howell, Michigan	Design of Stormwater Management Rain Garden	500.00
	SUBTOTAL		$ 1,500.00

III-2D. Total, Summarized by Phase

PHASE	Phase 300	Phase 400	Phase 500	Phase 600	Phase 700	TOTAL
Professional Fee	1,597.50	2,820.00	3,970.00	1,120.00	1,160.00	10,667.50
Reimbursable Expenses	0.00	750.00	1,250.00	0.00	500.00	1,500.00
SUB-TOTAL	1,597.50	3,570.00	5,220.00	1,120.00	1,660.00	
TOTAL CONTRACT AMOUNT						$ 12,167.50

DEPARTMENT OF TECHNOLOGY, MANAGEMENT & BUDGET,
VEHICLE AND TRAVEL SERVICES
SCHEDULE OF TRAVEL RATES FOR CLASSIFIED AND UNCLASSIFIED EMPLOYEES
Effective January 1, 2023

MICHIGAN SELECT CITIES*

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	$85.00	
Breakfast	$11.75	$14.75
Lunch	$11.75	$14.75
Dinner	$28.00	$31.00

MICHIGAN IN-STATE ALL OTHER

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	$85.00	
Breakfast	$9.75	$12.75
Lunch	$9.75	$12.75
Dinner	$22.00	$25.00

Lodging	$51.00
Breakfast	$9.75
Lunch	$9.75
Dinner	$22.00
Per Diem Total	**$92.50**

OUT-OF-STATE SELECT CITIES*

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	Contact Conlin Travel	
Breakfast	$15.00	$18.00
Lunch	$15.00	$18.00
Dinner	$29.00	$32.00

OUT-OF-STATE ALL OTHER

	Individual	Group Meeting (pre-arranged and approved)
Lodging**	Contact Conlin Travel	
Breakfast	$11.75	$14.75
Lunch	$11.75	$14.75
Dinner	$27.00	$30.00

Lodging	$51.00
Breakfast	$11.75
Lunch	$11.75
Dinner	$27.00
Per Diem Total	**$101.50**

Incidental Costs Per Day (with overnight stay) $5.00

Mileage Rates	**Current**
Premium Rate	$0.655 per mile
Standard Rate	$0.440 per mile

* See Select Cities Listing
** Lodging available at State rate, or call Conlin Travel at 877-654-2179 or www.somtravel.com

SELECT CITY LIST
SCHEDULE OF TRAVEL RATES FOR CLASSIFIED AND UNCLASSIFIED EMPLOYEES
Effective January 1, 2023

Michigan Select Cities/Counties		
	CITIES	**COUNTIES**
	Ann Arbor, Auburn Hills, Beaver Island, Detroit, Grand Rapids, Holland, Leland, Mackinac Island, Petoskey, Pontiac, South Haven, Traverse City	Grand Traverse, Oakland, Wayne
Out of State Select Cities/Counties		
STATE	**CITIES**	**COUNTIES**
Alaska	All locations	
Arizona	Phoenix, Scottsdale, Sedona	
California	Arcata, Edwards AFB, Eureka, Los Angeles, Mammoth Lakes, McKinleyville, Mill Valley, Monterey, Novato, Palm Springs, San Diego, San Francisco, San Rafael, Santa Barbara, Santa Monica, South Lake Tahoe, Truckee, Yosemite National Park	Los Angeles, Mendocino, Orange, Ventura
Colorado	Aspen, Breckenridge, Grand Lake, Silverthorne, Steamboat Springs, Telluride, Vail	
Connecticut	Bridgeport, Danbury	
District of Columbia	Washington DC (See also Maryland & Virginia)	
Florida	Boca Raton, Delray Beach, Fort Lauderdale, Jupiter, Key West, Miami	
Georgia	Brunswick, Jekyll Island	
Hawaii	All locations	
Idaho	Ketchum, Sun Valley	
Illinois	Chicago	Cook, Lake
Kentucky	Kenton	
Louisiana	New Orleans	
Maine	Bar Harbor, Kennebunk, Kittery, Rockport, Sandford	
Maryland	Baltimore City, Ocean City	Montgomery, Prince George
Massachusetts	Boston, Burlington, Cambridge, Martha's Vineyard, Woburn	Suffolk
Minnesota	Duluth, Minneapolis, St. Paul	Hennepin, Ramsey
Nevada	Las Vegas	
New Mexico	Santa Fe	
New York	Bronx, Brooklyn, Lake Placid, Manhattan, Melville, New Rochelle, Queens, Riverhead, Ronkonkoma, Staten Island, Tarrytown, White Plaines	Suffolk
Ohio	Cincinnati	
Pennsylvania	Pittsburgh	Bucks
Puerto Rico	All locations	
Rhode Island	Bristol, Jamestown, Middletown, Newport, Providence	Newport
Texas	Austin, Dallas, Houston, L.B. Johnson Space Center	
Utah	Park City	Summit
Vermont	Manchester, Montpelier, Stowe	Lamoille
Virginia	Alexandria, Fairfax, Falls Church	Arlington, Fairfax
Washington	Port Angeles, Port Townsend, Seattle	
Wyoming	Jackson, Pinedale	

APPENDIX 5

CERTIFICATES OF INSURANCE

FISHB-1 OP ID: JF

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 07/13/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Collins & Associates Corp. 5075 Cascade Rd. SE Grand Rapids, MI 49546 R. Parke Collins II 616-942-0957	CONTACT NAME: K.Jakubiak PHONE (A/C, No, Ext): 616-942-0957 FAX (A/C, No): 616-942-1118 E-MAIL ADDRESS: kjakubiak@insuredwithcollins.com
INSURED Fishbeck, Thompson, Carr & Huber Inc DBA Fishbeck 1515 Arboretum Dr SE Grand Rapids, MI 49546	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : Old Republic Ins Co — 24147 INSURER B : Continental Casualty Company INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC OTHER:	X	X	MWZY317013 23	02/01/2023	02/01/2024	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Emp Ben.	$ 1,000,000 $ 500,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $ 1,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY SCHEDULED AUTOS X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY	X	X	MWTB317014 23	02/01/2023	02/01/2024	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 2,000,000 $ $ $
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10000	X	X	7034241134	02/01/2023	02/01/2024	EACH OCCURRENCE AGGREGATE	$ 10,000,000 $ 10,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	X	MWC317012 23	02/01/2023	02/01/2024	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

ISID Contract No. 01010, 2023 Expanded Environmental Remediation ISID Services
The State of Michgan, its departments, divisions, agencies, offices, commissions, officers, employees, and agents are included as Additional insureds with respects to General Liability and Automobile Liability

CERTIFICATE HOLDER

STATEO1

State Of Michigan DTMB
3111 W. St. Joseph Street
Lansing, MI 48917

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
R. Parke Collins II

as required by contract or written agreement. A Waiver of Subrogation in favor of the Additional Insured is included for General Liability, Automobile Liability and Workers Compensation as required by contact or written agreemnent. 30 days notice of cancellation is included.

FISHTHO-01 CJOHNSON

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 7/11/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Ames & Gough 859 Willard Street Suite 320 Quincy, MA 02169	**CONTACT NAME:** **PHONE (A/C, No, Ext):** (617) 328-6555 **FAX (A/C, No):** (617) 328-6888 **E-MAIL ADDRESS:** boston@amesgough.com
INSURED Fishbeck , Thompson, Carr, & Huber, Inc. Dba Fishbeck 1515 Arboretum Drive SE Grand Rapids, MI 49546	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** **INSURER A :** Continental Insurance Company A(XV) 35289 **INSURER B :** **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	CLAIMS-MADE OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	POLICY PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						PER STATUTE OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
A	**Professional Liab.**			AEH254038073	10/31/2022	2/1/2024	**Per Claim Limit**	**5,000,000**
A				AEH254038073	10/31/2022	2/1/2024	**Annual Agg. Limit**	**10,000,000**

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

All Coverages are in accordance with policy terms and conditions.

RE: ISID Contract No. 01010, 2023 Expanded Environmental Remediation ISID Services. Professional Liability includes Pollution. 50K deductible.

CERTIFICATE HOLDER

State Of Michigan DTMB
3111 W. St. Joseph Street
Lansing, MI 48917

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Jared Maxwell

APPENDIX 6

FFEDERAL PROVISIONS ADDENDUM

(If your project is funded fully or in part by federal funds, this appendix applies)

STATE OF MICHIGAN
PROCUREMENT
Michigan.gov/MiProcurement

FEDERAL PROVISIONS ADDENDUM

This addendum applies to purchases that will be paid for in whole or in part with funds obtained from the federal government. The provisions below are required, and the language is not negotiable. If any provision below conflicts with the State's terms and conditions, including any attachments, schedules, or exhibits to the State's Contract, the provisions below take priority to the extent a provision is required by federal law; otherwise, the order of precedence set forth in the Contract applies. Hyperlinks are provided for convenience only; broken hyperlinks will not relieve Contractor from compliance with the law.

1. Equal Employment Opportunity

If this Contract is a "**federally assisted construction contract**" as defined in 41 CFR Part 60-1.3, and except as otherwise may be provided under 41 CFR Part 60, then during performance of this Contract, the Contractor agrees as follows:

a. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. 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. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

b. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

c. The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.

d. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

e. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

f. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

g. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

h. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided*, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Davis-Bacon Act (Prevailing Wage)

If this Contract is a **prime construction contract** in excess of $2,000, the Contractor (and its Subcontractors) must comply with the Davis-Bacon Act (40 USC 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"), and during performance of this Contract the Contractor agrees as follows:

a. All transactions regarding this contract shall be done in compliance with the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable. The contractor shall comply with 40 U.S.C. 3141-3144, and 3146-3148 and the requirements of 29 C.F.R. pt. 5 as applicable.

b. Contractors are required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

c. Additionally, contractors are required to pay wages not less than once a week.

3. Copeland "Anti-Kickback" Act

If this Contract is a contract for construction or repair work in excess of $2,000 where the Davis-Bacon Act applies, the Contractor must comply with the Copeland "Anti-Kickback" Act (40 USC 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work

Financed in Whole or in Part by Loans or Grants from the United States"), which prohibits the Contractor and subrecipients from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled, and during performance of this Contract the Contractor agrees as follows:

a. **Contractor**. The Contractor shall comply with 18 U.S.C. §874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

b. **Subcontracts**. The Contractor or Subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA or the applicable federal awarding agency may by appropriate instructions require, and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

c. **Breach**. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a Contractor and Subcontractor as provided in 29 C.F.R. § 5.12.

4. Contract Work Hours and Safety Standards Act

If the Contract is **in excess of $100,000** and **involves the employment of mechanics or laborers**, the Contractor must comply with 40 USC 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5), as applicable, and during performance of this Contract the Contractor agrees as follows:

a. **Overtime requirements**. No Contractor or Subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than 1 ½ times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

b. **Violation; liability for unpaid wages; liquidated damages**. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

c. **Withholding for unpaid wages and liquidated damages**. The State shall upon its own action or upon written request of an authorized representative of the

Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or Subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

d. **Subcontracts.** The Contractor or Subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the Subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. Rights to Inventions Made Under a Contract or Agreement

If the Contract is funded by a federal "funding agreement" as defined under 37 CFR §401.2 (a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or subrecipient must comply with 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

6. Clean Air Act and the Federal Water Pollution Control Act

If this Contract is **in excess of $150,000,** the Contractor must comply with all applicable standards, orders, and regulations issued under the Clean Air Act (42 USC 7401-7671q) and the Federal Water Pollution Control Act (33 USC 1251-1387), and during performance of this Contract the Contractor agrees as follows:

Clean Air Act

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2. The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

Federal Water Pollution Control Act

1. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2. The Contractor agrees to report each violation to the State and understands and agrees that the State will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency or the applicable federal awarding agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA or the applicable federal awarding agency.

7. Debarment and Suspension

A "contract award" (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (51 FR 6370; February 21, 1986) and 12689 (54 FR 34131; August 18, 1989), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

a. This Contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the Contractor is required to verify that none of the Contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

b. The Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

c. This certification is a material representation of fact relied upon by the State. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the State, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

d. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

8. Byrd Anti-Lobbying Amendment

Contractors who apply or bid for an award of **$100,000 or more** shall file the required certification in *Exhibit 1 – Byrd Anti-Lobbying Certification* below. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any

person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

9. Procurement of Recovered Materials

Under 2 CFR 200.322, Contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act.

a. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:

i. Competitively within a timeframe providing for compliance with the contract performance schedule;

ii. Meeting contract performance requirements; or

iii. At a reasonable price.

b. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensive- procurement-guideline-cpg-program.

c. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

10. Additional FEMA Contract Provisions.

The following provisions apply to purchases that will be paid for in whole or in part with funds obtained from the Federal Emergency Management Agency (FEMA):

a. Access to Records. The following access to records requirements apply to this contract:

i. The Contractor agrees to provide the State, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

ii. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

iii. The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

In compliance with the Disaster Recovery Act of 2018, the State and the Contractor acknowledge and agree that no language in this contract is intended to prohibit

audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

b. Changes.
See the provisions regarding modifications or change notice in the Contract Terms.

c. DHS Seal Logo and Flags.
The Contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval.

d. Compliance with Federal Law, Regulations, and Executive Orders.
This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The Contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.

e. No Obligation by Federal Government.
The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the State, Contractor, or any other party pertaining to any matter resulting from the Contract."

f. Program Fraud and False or Fraudulent Statements or Related Acts
The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

EXHIBIT 1
BYRD ANTI-LOBBYING CERTIFICATION

Contractor must complete this certification if the purchase will be paid for in whole or in part with funds obtained from the federal government and the purchase is greater than $100,000.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

   This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, enter contractor name here, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____

Signature of Contractor's Authorized Official

_____

Name and Title of Contractor's Authorized Official

_____

Date

APPENDIX TO
FEDERAL PROVISIONS ADDENDUM

§ 200.322 Domestic Preferences for Procurements

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

FEDERAL STATE and LOCAL FISCAL RECOVERY FUNDS (SLFRF) PROJECT SPECIFIC REQUIREMENTS

The funding being used for this project is Federal State and Local Fiscal Recovery Funds (SLFRF). As a result, additional provisions apply and are included in this Attachment.

Each primary contracted contractor with the DTMB must register with the Federal System for Award Management (SAM) must register prior to contract execution. The SAM website is https://sam.gov/content/home. The direct hyperlink for SAM.gov registration is https://sam.gov/content/entity-registration

As of April 4, 2022, the Federal government will use a Unique Entity Identifier (UEI) created in SAM.gov as the official subrecipient identifier. All primary contracted contractors with the DTMB will be required to maintain an active registration on SAM.gov. To receive payment, all primary contracted vendors need to have a Unique Entity Identifier (UEI) number and have the UEI entered in their SIGMA account. Information on the UEI and sign up can be obtained at: https://www.gsa.gov/about-us/organization/federal-acquisition-service/office-of-systems-management/integrated-award-environment-iae/iae-systems-information-kit/unique-entity-identifier-update

Contractor is to fill in and provide the following documentation for use in SLFRF reporting prior to Contract Execution for use in the reporting requirements:

Contractor's UEI

_____

Contractor's Full Legal Name

_____

Primary Point-of-Contact Email Address

_____

Business Address

_____

City Business is located

_____

State Business is located

_____

US Zip Code + 4 digits

_____