MINNESOTA POLLUTION CONTROL AGENCY

amec foster wheeler

Minnesota Pollution Control Agency

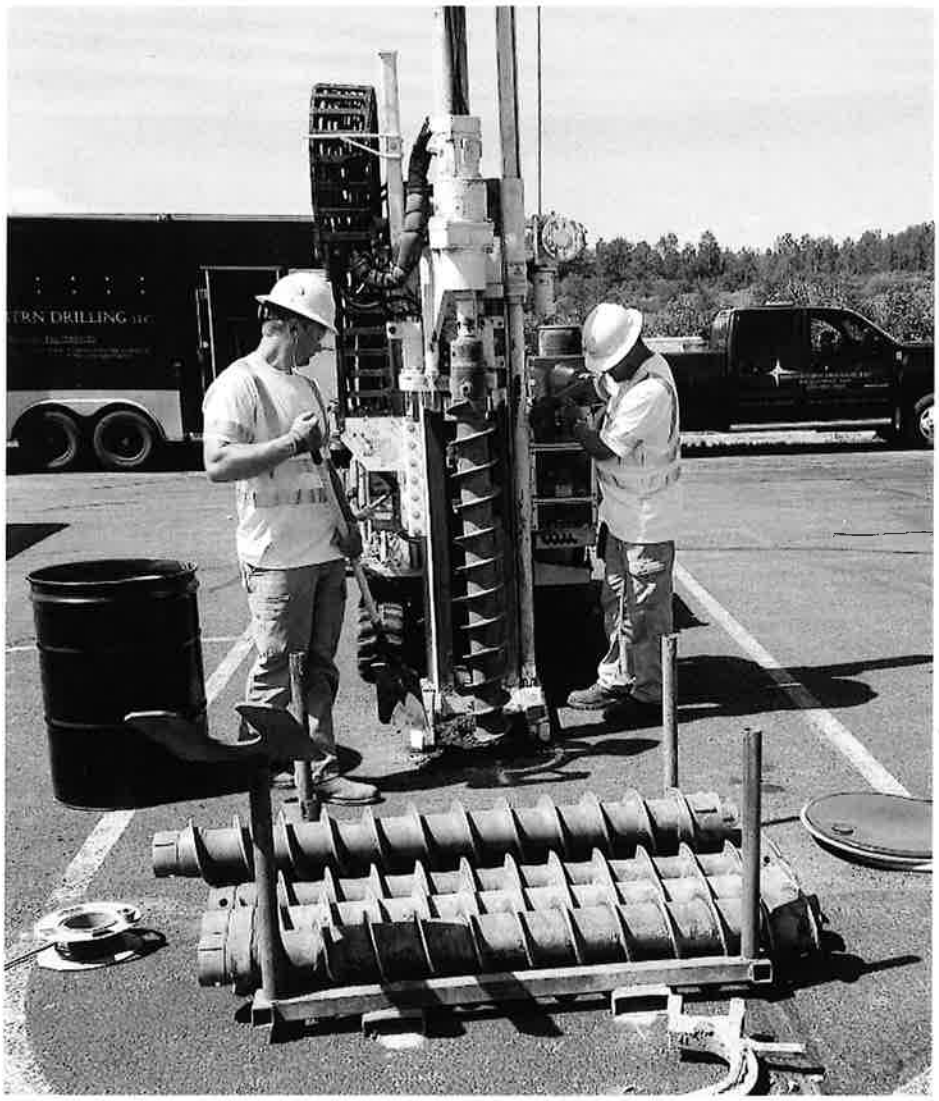
Remediation Master Contract

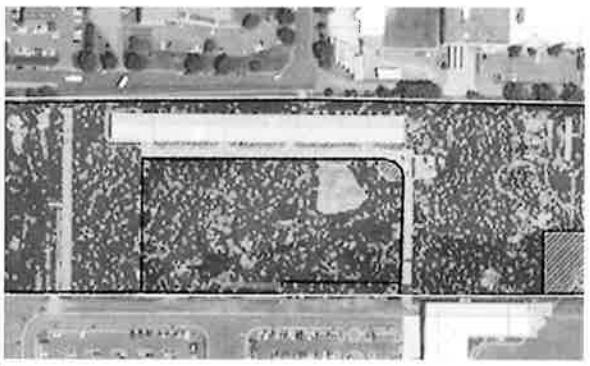
Category B – Petroleum Environmental Services

Submitted to:
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Submitted by:
Amec Foster Wheeler
Environment & Infrastructure, Inc.
800 Marquette Avenue, Suite 1200
Minneapolis, MN 55402

April 11, 2018





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B.1 Cover Letter

B.1 Cover Letter

April 11, 2018

Mary Heininger
Pollution Control Agency
520 Lafayette Road N
St. Paul, MN 55155-4194

Dear Ms. Heininger:

Subject: Category B: Petroleum Only Environmental Services Proposal

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) appreciates the opportunity to provide the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA) with this response to the Request for Proposal for Remediation Master Contract (RFP) dated February 28, 2018. This response, for Category B: Petroleum Only Environmental Services, addresses the original RFP and incorporates Addendum 1, dated March 19, 2018. Addendum 1 acknowledgement is provided in Appendix A. All references to RFP hereafter include the original RFP and all Addenda.

Amec Foster Wheeler has reviewed Section 5 of the RFP, Classification Levels and Rates and accepts the classifications and hourly rates as identified in Rate Schedule 1 (July 1, 2018 – June 30, 2020) and Rate Schedule 2 (July 1, 2020 – June 30, 2023).

Amec Foster Wheeler has reviewed Section 6 of the RFP, Supplies and Equipment Pricing and accepts the costs as identified. Amec Foster Wheeler understands that the costs shown in Section 6 of the RFP are inclusive of applicable taxes, fees, insurance costs, direct costs, overhead and profit.

As of October 2017, Amec Foster Wheeler was acquired by John Wood Group, plc. and established the new company, Wood plc. (LSE: WG.L), a global leader in the delivery of project management, engineering and technical services to its customers in the world's oil and gas, mining, clean energy, environment and infrastructure markets. With annual revenues of over $10 billion, we design, deliver and maintain strategic and complex assets and employ over 55,000 people in more than 60 countries worldwide. Amec Foster Wheeler currently operates as a wholly owned subsidiary of Wood and will legally change its operating name to Wood Environment & Infrastructure Solutions during the second quarter of 2018.

Amec Foster Wheeler's Environment & Infrastructure business is a leading environment and infrastructure, engineering, consulting and project management organization with more than 175 offices and over 6,500 employees worldwide. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy.

Amec Foster Wheeler's Environment & Infrastructure organization is headquartered in Alpharetta, GA and is led by our President, Ms. Anne Massey. Two US Regional (Eastern and Western) and two Canadian Regional (Eastern and Western) Managers report directly to Ms. Massey. The Amec Foster Wheeler Minneapolis office resides in the Eastern Group under the direction of Senior Vice President, Lytle Troutt. The addresses of the Headquarters and local office are as follows:

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US Headquarters
1105 Lakewood Parkway, Suite 300
Alpharetta, GA 30009
Tel: 770 360 0600
Fax: 770-360-0540

Local Office
800 Marquette Avenue, Suite 1200
Minneapolis, MN 55402
Tel: 612-332-8326
Fax: 612-332-2423

We intend to primarily draw on our environmental staff of the Minneapolis office to serve the contract with secondary support from our employees across the EPA Region 5 states in Illinois, Indiana, Michigan, Ohio, and Wisconsin as well as our nationally-recognized subject matter experts around the US to support the contract in special cases.

Ms. Emma Driver will continue to serve as the contract manager and designated point of contact for all MPCA and MDA related work. Amec Foster Wheeler employees have worked from 2008 through 2018 on the existing MPCA/MDA Multi-Site Contract and have expertise preparing technical reports, agency invoicing documents, and other contract required deliverables (e.g., Equipment and Usage Summary Reports) directly for the MPCA/MDA. Ms. Driver will assign appropriate project staff, including project managers and technical staff, to bring together the skills and experience required on each project.

The Amec Foster Wheeler local office is within 20 minutes of the MPCA and MDA locations and the entire local Amec Foster Wheeler Team can be available in a moment's notice by telephone or for face-to-face meetings to address all contractual and project-specific concerns. In the event communication is required after regular business hours, all Amec Foster Wheeler Project Managers are available via cell phone. We pride ourselves on our customer service and prompt replies. We are dedicated to rapid resolution of potential issues so that our projects can move forward on schedule, within budget, in the most technically proficient manner. Local resources include project managers, scientists, geologists, engineers, QA/QC officers, risk assessors, groundwater modelers, on-site inspectors and field technicians.

Amec Foster Wheeler has reviewed the proposed Sample Contract Terms and Conditions supplied in Attachment 1 of the RFP. We do not have any exceptions to the contract as presented in Attachment C.

Please contact Ms. Emma Driver or the Minneapolis office manager, Mr. Curtis Hudak should you have any additional questions or require any additional information. Amec Foster Wheeler is excited to continue to work the MPCA and MDA on environmental solutions to benefit individual communities and the citizens of Minnesota.

Additional information regarding Amec Foster Wheeler is available on our website www.woodplc.com.

Sincerely yours,

Amec Foster Wheeler Environment & Infrastructure, Inc.

Curtis M. Hudak, PhD, PG
Minneapolis Office Manager
Direct Tel.: 612-252-3757
Cell: 612-406-9644
E-mail: curtis.hudak@amecfw.com

Emma Driver, PMP
MPCA Contract Manager
Direct Tel.: 612-252-3641
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E-mail: emma.driver@amecfw.com

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B.2 Qualifications and Capabilities

B.2 Qualifications and Capabilities

B.2.1 Summary of Overall Capabilities

Amec Foster Wheeler Environment & Infrastructure, Inc., herein referred to as Amec Foster Wheeler, is an environmental consulting, engineering and design, and construction company operating with over 6,500 professionals in 175 locations. Serving the government, clean energy, industrial/commercial, mining, oil & gas, transportation, and water sectors, we provide services to both public and private clients worldwide. The *Engineering News-Record*'s 2017 listing ranked Amec Foster Wheeler 7th of the "Top 500 Design Firms" and 10th of the "Top 200 Environmental Firms".

Amec Foster Wheeler draws upon over 40 years of experience in environmental science and engineering to provide a comprehensive range of environmental services. Our service offerings fall into eight main categories, including:

- **Civil / Site**: planning, site design, grading/drainage plans, storm water management, utilities;
- **Construction:** construction management, construction monitoring, new build, decontamination/decommissioning/demolition, remedial construction, nuclear construction management;
- **Environmental Engineering:** assessment, remediation, hazardous/toxic materials, sediments;
- **Environmental Sciences:** environmental impact assessment and permitting (including NEPA); natural resources management (terrestrial, aquatic, and marine); cultural resources management; environmental health and safety management, compliance, and due diligence; air quality, acoustics, and climate change / greenhouse gases; occupation health and safety;
- **Geosciences:** geotechnical, geology seismology, hydrology, hydrogeology, meteorology;
- **Materials Engineering:** soils, concrete, Non-destruction evaluation (NDE) for metals, welding engineering, forensics;
- **Pure Sustainability Services:** program consulting, stakeholder engagement, climate change, resource conservation, operational efficiency, social responsibility and human environment factors;
- **Water Resources:** watershed management, groundwater modelling, TMDL studies, and stream restoration.

Locally in Minnesota, our firm is represented by more than 120 employees. Our regional resources also include more than 250 employees across the United States Environmental Protection Agency (EPA) Region 5 States, comprised of more employees in Illinois, (Chicago and Peoria), Indiana (Indianapolis), Michigan (Novi and Traverse City), Ohio (Dayton), Wisconsin (Madison).

Our firm is exceptionally qualified to support the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA) because we offer:

- **Level 3 Environmental Services Contractor Experience**. Amec Foster Wheeler has held the MPCA/MDA Level 3 Environmental Services contract since July 2008 and has had the opportunity to work with nearly 20 different MPCA project managers to support more than 180 different Work Orders over the last 10 years. As a result, we are intimately knowledgeable about the policies, procedures, and

Amec Foster Wheeler has held the MPCA/MDA Level 3 Contract for 10 years, supporting over 180 projects across Petroleum Remediation Program, Site Assessment and Superfund.

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protocols that govern project initiation, planning, execution, monitoring and controlling, and closing of state projects. We have had the opportunity over the last 10 years to meet annually with the MPCA to discuss our performance and continue to strive for opportunities for continual improvement in executing the contract. This is a benefit to both the MPCA and MDA as we immediately have the ability to effectively tackle new project work with little to no learning curve.

- **Robust Local Presence with Global Reach**. Amec Foster Wheeler's local office offers a group of talented professional staff that includes environmental, civil, mechanical and electrical engineers, geologists, hydrogeologists, risk assessors, groundwater modelers, biologists, geophysicists, field technicians, on-site inspectors, and GIS and CAD designers. Our exceptional ability to serve our clients locally is evidenced in the diversity of our group. This, coupled with the ability to draw from specialty resources from around the company, allows us to meet any needs that MPCA or MDA may have. Amec Foster Wheeler has been able to illustrate this under the current and previous contract when we teamed with MPCA to perform special projects for a Perfluorochemical Information Clearinghouse and support of the Soil Reference Value (SRV) Work Group Guidance. This ability is a benefit to MPCA and MDA as we are able to offer Project teams that can provide both strong State regulatory knowledge and experience as well as international experts to supplement as and where needed.
- **Extensive Regulatory Knowledge**. With several individuals on our project team having more than 30 years of environmental experience in the state of Minnesota, Amec Foster Wheeler is able provide the MPCA and MDA with extensive regulatory knowledge. Our staff are thoroughly knowledgeable about MPCA Risk Based Site Evaluation (RBSE) Manual, Underground Storage Tank (UST) and Aboveground Storage Tank (AST) Release Cleanup Guidance Documents and Fact Sheets, Voluntary Investigation and Cleanup (VIC) Guidance Documents, and MDA Guidance Documents. We are extremely knowledgeable about the Minnesota Environmental Response and Liability Act (MERLA), the Land Recycling Act (LRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) as amended, the Resource Conservation and Recovery Act (RCRA), and the National Oil and Hazardous Substances Contingency Plan (more commonly called the National Contingency Plan [NCP]).
- **Proven Track Record with Technology Innovation**. Amec Foster Wheeler strives to be at the leading edge of technology and innovation and as such has been and continues to be involved in research and development efforts via the Department of Defense's Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP). In the last year, our staff have secured more than $2 million in funding through ESTCP and SERDP for research and development as well as demonstration and validation for PFAS remediation technologies. Amec Foster Wheeler is also an Industry Affiliate Member of the ITRC and has active membership on several Teams in addition to the PFAS Team mentioned above. Other teams include but not limited to the Contaminated Sediments Team, Remediation Team, the dense non-aqueous phase liquid (DNAPL) Site Characterization Team, the Geophysical Classification Team, the Petroleum Vapor Intrusion Team and the Fractured Bedrock Team. This is a benefit to both MPCA and MDA as we have the ability to not only efficiently support the Petroleum, Superfund, MDA and Closed Landfill programs but we are able to bring unique and innovative out-of the-box solutions to any project.

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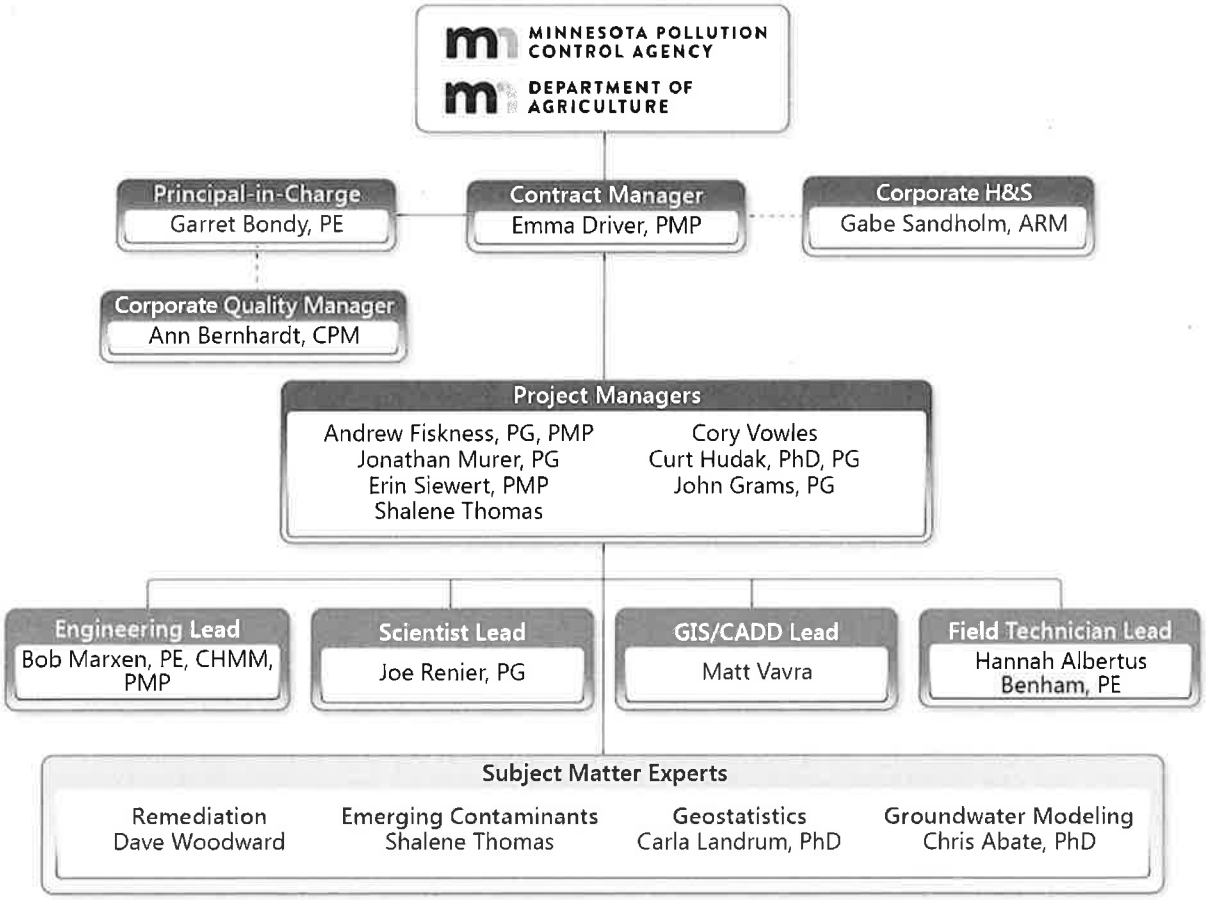
B.2.2 Resumes of Key Staff

The key staff assigned to the contract are presented in **Exhibit 1**.

Exhibit 1. Organizational Chart



The following roles and responsibilities are defined for key staff:

Contract Manager, Emma Driver, PMP

Ms. Emma Driver will serve as the program manager. In this role, she will ensure that Amec Foster Wheeler is meeting and exceeding the expectations of the MPCA, including Petroleum Remediation Program, Site Assessment/Superfund and Closed Landfill contract managers and project leads and MDA project managers. Ms. Driver will also ensure that Amec Foster Wheeler is performing effectively within the program. Ms. Driver will continue to utilize a program framework that identifies metrics for project managers to adhere to ensure that consistent and high-quality work products are delivered to MPCA and MDA on every project. Ms. Driver will initiate bi-annual meetings with the MPCA and MDA to discuss overall program performance, project delivery and project managers; she will incorporate the feedback back into the program to ensure continual improvement. Ms. Driver is currently serving as the contract manager for the existing Technical and Master Services contract.

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Principal-in-Charge, Garret Bondy, PE

Mr. Bondy is a Regional Manager and Senior Principal Engineer at Amec Foster Wheeler, with over 30 years of environmental experience across EPA Region 5. Mr. Bondy, has extensive environmental and engineering experience in support of brownfield redevelopment projects; site and remedial investigations; remedial design and remedial action; construction management and oversight; landfill engineering; sediment sampling design and remediation; and, regulatory negotiations. Mr. Bondy also serves as Program Manager for multiple state contracts, including an Environmental Remediation contract with the Michigan Department of Environmental Quality. Prior to his career at Amec Foster Wheeler, Mr. Bondy also served as a Superfund Enforcement Section Chief in EPA Region 6.

In the role of Principal-In-Charge, Mr. Bondy will act as the key link between the contract manager and the organization's executive management, including quality manager. Mr. Bondy will help the contract manager facilitate the necessary organizational support needed to make strategic decisions and create successful projects. He will also facilitate problem solving by ensuring that any issues outside of the contract manager's authority are escalated and solved quickly and effectively at the organizational level.

Corporate Quality Manager, Ann Bernhardt, CMQ/OE, CPM

Ms. Bernhardt is the Director of Quality Assurance for Amec Foster Wheeler, Environment & Infrastructure, Inc. She oversees the development, improvement, and implementation of our company's quality program. Our quality program is based on ISO principles and provides the basis for consistent, reliable project delivery. The effectiveness of our program is measured through Customer Satisfaction surveys, audits, and management reviews. We continuously integrate improvements to our program that increase the value of our project delivery to our Customers. Ms. Bernhardt has over 25 years of experience and has served as a QA/QC Manager on multiple government contracts overseeing the quality of our team's delivery primarily executing site characterizations, site investigation, feasibility study, remediation, and construction projects. She has successfully led the quality program for the EPA, Air Force, Navy, Coast Guard, and multiple commercial clients and she has served on the PFAS Work Group leading the development of the PFAS analytical laboratory quality assurance and audit program for Amec Foster Wheeler. Ms. Bernhardt will ensure the overall quality of work conducted for the MPCA/MDA and will conduct quality audits throughout the duration of the contract. Ms. Bernhardt, will also independently evaluate any quality concerns with the MPCA/MDA should they arise.

Corporate Health & Safety, Gabe Sandholm, ARM

Mr. Gabe Sandholm will serve as the Health and Safety Manager for the MPCA and MDA contract. Mr. Sandholm will meet quarterly with the contract manager, Ms. Driver, to ensure Amec Foster Wheeler health & safety policies are consistently adhered to; he will also ensure project health and safety audits are being performed and if warranted, corrective measures be completed. Mr. Sandholm will ensure that Health and Safety Plan templates are adequate and respond to any health and safety questions or comments that the project team members may have. Amec Foster Wheeler will share any lessons learned with the MPCA and MDA project leads to promote our shared safety goals.

Project Managers, Multiple

Our team of selected project managers have been managing projects in the state of Minnesota for over 100 years combined, and includes staff that have been managing projects directly for the MPCA and MDA since 2008. Our project managers have diverse project experience and backgrounds and will be selected to manage projects based on the project objectives. All project managers within our organization are required to complete internal project manager training through our Amec Foster Wheeler Academy, which holds accreditation through the Association for Project Management (APM). In addition, several of our project managers have completed external certification (i.e., Project Management Professional [PMP®]) through the Project Management Institute.

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The project manager's role is the overall responsibility for the successful planning, execution, monitoring, control and closure of a project and Work Order. In this role, the project manager will ensure the project meets scope, schedule, and budget constraints and exceeds the MPCA or MDA's expectations. The project manager will also ensure that the project team is adhering to all contractual terms and conditions for the duration of the project and all information is appropriately and effectively communicated to stakeholders in a timely manner.

Engineering Lead, Bob Marxen, PE, CHMM, PMP

Mr. Bob Marxen will serve as the Engineering Lead. In this role, he will serve as the lead for all engineering resources defined for the contract and listed on the matrix of staff. Mr. Marxen has over 30 years of experience working in the environmental industry in Minnesota as an engineer, construction manager and project manager. Mr. Marxen holds current Minnesota Erosion/Sedimentation Control Certification and is a Minnesota certified asbestos inspector. Mr. Marxen has extensive experience working with Minnesota Guidance and Policy. In the role of engineering lead, Mr. Marxen will define best practices for engineering services and ensure they are implemented on every project. He will also serve as peer review for all project work products that involve remedial investigation, remediation design, implementation, and operation. He will mentor mid- and junior staff as needed.

Remediation Engineer, Justin Gal, PE

Mr. Gal has 13 years of consulting experience in the development, design and construction of innovative remedial strategies. He specializes in the development and implementation of remedial strategies for Non-Aqueous Phase Liquid (NAPL) impacted properties with extensive project experience at variety of former industrial and manufacturing facilities throughout the U.S., resulting in successful negotiation of site closure with regulatory agencies and provides a variety of methods to maximize client cost avoidances. Mr. Gal has consulted on a variety of technologies such as NAPL recovery trenches and wells, in situ chemical oxidation (ISCO), thermal remediation, dig and haul, permeable reactive barriers (biotic and abiotic reactive media), containment barriers, in-situ solidification and stabilization, sub-slab depressurization systems (SSDS), and a variety of ex-situ soil and ground water treatment technologies, as well as performing treatability and feasibility studies for technology application.

Scientist Lead, Joe Renier, PG

Mr. Renier will serve as the Scientist Lead. In this role, he will serve as the Lead for the Scientist resources defined for the contract and listed on the matrix of staff. He will define best practices for geology and hydrogeology services and ensure they are implemented on every project. He will also serve as peer review for all project work products that involve conceptual site development; groundwater, soil, surface water, and air sampling; and site investigation. He will mentor mid- and junior staff as needed.

GIS/CADD Specialist Lead, Matt Vavra

Mr. Matt Vavra will serve as the GIS/CADD Specialist Lead. In this role, Mr. Vavra will ensure that adequate and consistent standards are developed for all GIS and CAD work products. He will develop MPCA and MDA map templates and oversee other GIS/CADD specialists in map production. He will also ensure all data submitted to MPCA/MDA meets the minimum data deliverable requirements and State spatial data standards.

Onsite Inspector, Hannah Albertus-Benham, PE

Ms. Hannah Albertus-Benham will serve as an On-Site Inspector and field technician lead. In this role, Hannah will ensure that standard operating procedures and MPCA guidelines are being strictly adhered to for all field efforts. Ms. Albertus-Benham will lead the field crews in evaluating various field methodologies and ensuring Amec Foster Wheeler are in compliance with all field protocols. Ms. Albertus-Benham has worked with the MPCA for the past five years on the existing MPCA technical services contract and is familiar with all aspects of the MPCA risk based site evaluation documents and the MPCA quality assurance program.

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Subject Matter Experts (SME)

Nationally-recognized subject matter experts have been identified to support the contract. Each SME identified herein has been thoughtfully selected in anticipation of MPCA project needs on the contract. The SMEs are mapped to contract rates as shown in Exhibit 3.

Remediation, David Woodward

Mr. Woodward has more than 32 years of experience in environmental investigation and remediation. He currently serves as the Remediation Practice Leader for Amec Foster Wheeler. He is responsible for contract research and development (R&D) for industry and governmental authorities. He has authored or co-authored over 100 publications, given over 50 platform conference presentations, served as an invited expert panelist, led the development of numerous industry and government guidance and standards covering all aspects of soil and groundwater investigation and remediation. He also serves as Amec Foster Wheeler's Per- and Polyfluoroalkyl Substances (PFAS) Technical Leader, responsible for advancing our understanding of PFAS investigation, fate and transport, and remediation. He has over 10 years of experience conducting PFAS investigations and remediation in the U.S., Canada, Europe, and Australia on projects associated with PFAS Mfg., Manufacturers using PFAS, and on sites involving AFFF. His experience includes R&D projects for private industry, American Petroleum Institute, Swedish Government, Canadian Government, Australian DOD, U.S. DOD/SERDP, and the U.S. Air Force. He has also applied advanced PFAS analytical techniques in support of PFAS R&D, including: Total Oxidizable Precursor Assay (TOP), Particle Induced Gamma Ray Emissions (PIGE) Test, and Total Organic Fluorine (TOF) testing.

Emerging Contaminants, Shalene Thomas

Shalene Thomas is the Emerging Contaminant Program Manager for Amec Foster Wheeler. She has more than 19 years of experience in environmental consulting that includes 10 years of experience supporting PFASs evaluations. She has extensive program and project management, human health risk assessment, data management, GIS and 3D visualization and animation, and site investigation experience and has supported state, federal and industrial clients with PFAS evaluations, including leading the development of an information clearinghouse on the emerging contaminant class for the MPCA. Ms. Thomas currently serves as the PFAS Work Group Manager for Amec Foster Wheeler and has supported PFAS projects in 32 different states in 9 of the 10 USEPA regions as well as projects in Australia and Canada. Ms. Thomas also led the ITRC PFAS Team Proposal and serves on the regulatory/risk task force for the ITRC PFAS Team as well as the co-lead for AFFF Fact Sheet. Ms. Thomas was also a contributing author for the regulatory section of the National Groundwater Association (NGWA) PFAS State of Knowledge and Practice document.

Geostatistics and Data Management, Carla Landrum, PhD

Dr. Landrum has more than 5 years of experience and an applied background in sampling and monitoring design, Phase I and Phase II site characterization, data analyses and interpretation, and environmental risk assessment. Ms. Landrum specializes in minimally invasive site investigative technologies to rapidly characterize shallow subsurface environments with reduced risk, liability, and cost. These technologies include environmental geophysics, LiDAR, portable X-ray fluorescence spectroscopy, and global positioning systems. She fuses these high resolution technologies with sparse direct environmental sampling approaches, including soil coring and geologic borings, using space-time analytical platforms to: optimize sampling and monitoring designs (establish where, when, and number of observations needed); pinpoint source(s), spatial extent(s), and potential migration pathway(s) of constituents of potential concern; establish background concentrations; map risk point exposure concentrations; provide accurate remediation costs by mapping probable concentrations, boundaries, surface areas, volumes and masses of contaminated material with measured confidence; negate risk and liability by measuring and reducing uncertainty in spatial and temporal estimates; and prove remediation endpoints and regulatory compliance.

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Groundwater Modeling, Chris Abate, PhD

Dr. Abate has 26 years of experience in environmental geology, hydrogeology, modelling of water resources, project management, and litigation support. He has provided technical and management support for site investigations and remedial design efforts under the RCRA/CERCLA/MCP programs for a range of federal and private clients. Dr. Abate has specific expertise in the application of quantitative methods to water resource problems, including wellhead protection, groundwater remediation system design, stormwater management, and non-point source pollution. He has developed and calibrated groundwater flow models for the purposes of risk assessment, wastewater permitting, water supply management, mine dewatering, and assessing contaminant fate and transport and also performed and analyzed aquifer tests and sited water supply wells for clients in coastal plain, glaciated, and hard rock terrains. In addition, he has experience in assessment of Munitions and Explosives of Concern (MEC) distribution and environmental impacts at DOD sites with military training ranges. Dr. Abate has provided expert testimony and made numerous presentations at stakeholder meetings and technical conferences on quantitative methods for site assessment and remedial design as well as other aspects of applied hydrogeology and environmental geology.

The resumes for key project personnel are included in Appendix **B.**

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B.2.3 Staff Matrix

Exhibit 2 presents a matrix of project staff offered for the contract. The matrix includes name, primary classification, OSHA certification, summary of educational experience, years of service with the company (and total years of experience), work experience, licenses and certifications held, and the location of those individuals (i.e., local [L], regional [R] or outside the region [O]). The table is organized by personnel classification category and all key staff are identified clearly with a key symbol (🗝). More than 6500 additional staff are available to serve the contract as/if needed.

Exhibit 2. Matrix of all Project Staff

CATEGORY B										
Name	Classification	OSHA Training	Educational Experience (Highest Degree Shown)	Work Experience				Years of Service	Licenses / Certifications	Location
				A	B	C	D			
Key Project Personnel and Subject Matter Experts										
🗝 C. Abate	Scientist 2 (SME – Groundwater Modeling)	●	PhD/Geosciences	●			●	17 (27)	--	O
🗝 H. Albertus-Benham	Engineer 2 (Field Technician Lead)	●	MS/2009/Civil Engineering	●	●	●	●	1 (3)	PE - MN Asbestos Inspector (State of MN), Stormwater Construction Site Management	L
🗝 A. Bernhardt	Scientist 2 (Corporate Quality Manager)	●	BS/1991/ Env. Science		●	●	●	23 (25)	CMQ/OE, CPM	O
🗝 G. Bondy	Project Manager, Engineer 3 (Principal-in-Charge)	●	BS/1979/ Env. Science & Engineering	●	●	●	●	26 (34)	PE	R
🗝 E. Driver	Project Manager (Contract Manager)	●	BS/2000/Geography	●	●	●	●	16 (18)	PMP	L
🗝 A. Fiskness	Project Manager	●	BS/1998/Geology	●	●	●	●	8 (19)	PG, PMP	L
🗝 J. Gal	Engineer 2 (Remediation Engineer)	●	BSE/2004/Civil Engineering		●	●	●	5 (13)	PE-MN	R
🗝 J. Grams	Project Manager	●	MS/1987/Geochemistry	●	●	●	●	4 (26)	PG, CPG	L
🗝 C. Hudak	Project Manager	●	PhD/1987/Geology	●	●	●	●	2 (32)	PG - MN	L
🗝 C. Landrum	Scientist 2 (SME – Geostatistics and Data Management)	●	PhD/2013/Soil Science/Geostatistics	●	●	●	●	3 (10)	--	L

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Exhibit 2. Matrix of all Project Staff

CATEGORY B										
Name	Classification	OSHA Training	Educational Experience (Highest Degree Shown)	Work Experience				Years of Service	Licenses / Certifications	Location
				A	B	C	D			
🗝 B. Marxen	Project Manager/Engineer 3 (Engineering Lead)	●	BS/1986/Chemical Engineering BS/1987/Mathematics	●	●	●	●	14 (30)	PE, PMP, CHMM, Asbestos Inspector (State of MN), Stormwater Construction Site Management	L
🗝 J. Murer	Project Manager	●	MS/1989/Water Resources	●	●	●	●	3 (29)	PG	L
🗝 J. Renier	Scientist 2 (Scientist Lead)	●	MS/1982/Geology	●	●	●	●	16 (30)	PG	L
🗝 G. Sandholm	Scientist 2 (Corporate Health & Safety)		MBA/2008	●				16 (18)	ARM	L
🗝 E. Siewert	Scientist 2	●	BS/2005/Env Studies	●	●	●	●	9 (12)	PMP	L
🗝 S. Thomas	Project Manager (SME – Emerging Contaminants)	●	MS/1998/Environmental Science & Mgmt	●	●	●	●	16 (19)	PMP	L
🗝 M. Vavra	GIS/CADD Specialist	●	MGIS	●	●	●	●	13 (15)	--	L
🗝 C. Vowles	Project Manager	●	BS/2006/Biochemistry	●	●	●	●	12 (12)	--	L
🗝 D. Woodward	Scientist 2 (SME – Remediation)	●	BS/1984/Earth Sciences		●	●	●	2 (32)	--	O
Engineers										
Z. Al-Yassiri	Engineer 1/Technician	●	BS/2013/Environmental Engineering				●	1 (2.5)	EIT	R
S. Bashir	Engineer 2	●	MS/2003/Civil Engineering		●	●		4 (13)	PE - MI	R
A. Gagne	Engineer 3	●	MS/1999/Environmental Eng.	●	●	●	●	8 (7)	PE	R
S. Hansen	Engineer 3		BS/Chemical Engineering		●	●		6 (9)	PE-MN	L
G. Hauck	Engineer 3		BChE				●	15 (35)	PE-MN	L
K. Krol	Engineer 2		BS/2004/Civil Engineering		●		●	14 (16)	PE-MN	L
J. Moran	Engineer 2		BS/1997/Civil Engineering		●			6 (14)	PE-MN	L
D. O'Connell	Engineer 3		BS/Chemical Engineering				●	23 (25)	PE-MN	L

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Exhibit 2. Matrix of all Project Staff

CATEGORY B										
Name	Classification	OSHA Training	Educational Experience (Highest Degree Shown)	Work Experience				Years of Service	Licenses / Certifications	Location
				A	B	C	D			
D. Ott	Engineer 4	●	MS/2005/Civil Eng.	●	●	●	●	22 (27)	PE - MN	L
E. Palomino	Engineer 2		BS/1989/Electrical Engineering				●	2 (27)	PE-MN	L
J. Paul	Engineer 1/Technician		MS/2012/Civil Engineering		●			5 (6)	PE-MN	L
C. Starkell	Engineer 1	●	BS/2001/Mechanical Engineering				●	10 (17)	PE-MN	L
D. O'Connell	Engineer 3		BS/Chemical Engineering				●	23 (25)	PE-MN	L
T. Rasmussen	Engineer 4	●	MS/1992/Civil Engineering	●	●	●	●	16 (22)	PE, PG	L
T. Shannon	Engineer 1/Technician	●	BS/2012/Mechanical Engineering			●	●	3 (3)	PE-MN	L
Scientists/Technicians										
J. Abid	Scientist 2	●	BS/2005/Biology		●	●		13 (13)	--	R
B. Barnes	Scientist 1	●	BS/Env. Science		●	●		3 (10)		L
C. Buckman	Scientist 2	●	MS/2004/Geology	●	●	●	●	3 (11)	PG	L
D. Costamagna	Scientist 2	●	BS/2003/Geology		●	●	●	15 (17)	PG	L
R. Crawford	Scientist 1/Technician	●	BS Geology		●	●	●	2 (2)	--	R
S. Cronin	Scientist 2	●	MS/2007/ Rangeland Ecosystem Science-Restoration Ecology	●	●	●	●	5 (18)	--	L
D. Costamagna	Scientist 2	●	BS/2003/Geology		●	●	●	15 (17)	PG	L
P. Goudreault	Scientist 2		MS/1985 Hydrogeology	●	●	●	●	5 (24)	--	L
S. Henson	Scientist 1/Technician	●	BS/2016/Geology and Geophysics	●	●	●	●	2 (2)	--	L
E. Heytens	Scientist 2	●	BS/Geology		●	●	●	3 (30)	--	L
G. Horstmeier	Scientist 1/Technician	●	BS/2017/Geology				●	1 (1)	--	R
A. Klaustermeier	Scientist 1/Technician	●	MS/2016/Soil Science	●	●	●	●	2 (2)	--	L
R. Lahti	Scientist 2	●	BS/1984/Applied Geophysics	●	●	●	●	5 (34)	PG	L
M. Matteson	Scientist 1/ Technician	●	BS/2013/Geological Engineering		●	●	●	2 (6)	--	R
D. Miller	Scientist 1/Technician		MS/Env. Engineering				●	3 (3)	--	L

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Exhibit 2. Matrix of all Project Staff

CATEGORY B										
Name	**Classification**	**OSHA Training**	**Educational Experience (Highest Degree Shown)**	**Work Experience**				**Years of Service**	**Licenses / Certifications**	**Location**
				A	**B**	**C**	**D**			
J. Wegleitner	Scientist 1 / Technician	●	AA/2003/Architectural Drafting and Estimating	●	●	●	●	5 (11)	--	L
M. Matteson	Scientist 1/ Technician	●	BS/2013/Geological Engineering		●	●	●	2 (6)	--	R
C. Smith	Scientist 1/Technician	●	MS/2016/Geology	●	●	●	●	2 (2)	--	L
M. Torres	Scientist 2	●	BA/2000/Geology	●	●	●	●	11 (11)	--	L
J. Wegleitner	Scientist 1 / Technician	●	AA/2003/Architectural Drafting and Estimating	●	●	●	●	5 (11)	--	L
Other										
E. Thomas	GIS/CADD Specialist		MS/2013/ Civil Engineering		●		●	5 (8)	--	R

Licenses/Certifications Abbreviations:	
AEP	Associate Environmental Professional
ARM	Associate in Risk Management Certification
BCEE	Board Certified Environmental Engineer
CEM	Certified Energy Manager
CHMM	Certified Hazardous Materials Manager
CMQ/OE	Certified Manager of Quality/Organizational Excellence
CPCP	Certified Building Commissioning Professional
CPG	Certified Professional Geologist
EAC	Environmental Analytical Chemist
EIT	Engineer-in-Training
LEED AP	Leadership in Energy and Environmental Design Accredited Professional
PE	Professional Geologist
PG	Professional Geologist
RPA	Register of Professional Archaeologists
PMP	Project Management Professional

Work Experience
A = Existing MPCA/MDA Experience
B = MN Site Investigation/Remedial Investigation Experience
C = Risk Based Site Evaluation Manual Knowledge
D= UST/AST Release Cleanup, VIC, Superfund, MDA Guidance Document Knowledge

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B.2.4 Firm Locations

Amec Foster Wheeler's US headquarters and the local office supporting the contract are listed below.

US Headquarters
1105 Lakewood Parkway, Suite 300
Alpharetta, GA 30009
Tel: 770-360-0600

Local Office
800 Marquette Avenue, Suite 1200
Minneapolis, MN 55402
Tel: 612-332-8326

Exhibit 4 presents all offices in the US with additional qualified resources. Offices within Region 5 supporting this contract are designated within the exhibit.

Exhibit 4. US Office Map

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B.2.5 Knowledge of the MPCA Petroleum Remediation Program's Consultant Guidance for UST/AST Release Investigation and Cleanup

From our nearly 20 years of experience providing environmental services in Minneapolis and 10 years working directly for the MPCA Petroleum Remediation Program as part of past Level III Technical and Professional Services contract, our staff has gained a valuable and detailed knowledge of the PRP Guidance for Underground Storage Tank (UST) and Aboveground Storage Tank (AST) Release Clean-up. Our knowledge of the applicable guidance documents is described further as follows.

- **Petroleum Remediation Program: Guidance Documents for Underground Storage Tank (UST) and Aboveground Storage Tank (AST) Release Cleanup** – The Petroleum Remediation Program (PRP) guidance documents provide a risk-based approach for investigating and evaluating risks from petroleum tank releases with the main objective of protecting human health and the environment. As defined in PRP guidance, the primary risks evaluated by the program are: i) impacts to groundwater that threaten human health, ii) petroleum vapors that may lead to dangerous conditions or threaten human health; iii) impacts to surface water quality; and iv) impacts to surface soil that threaten human health or may lead to contaminated surface runoff (PRP, 2017). The guidance documents are organized into the following groups resembling separate stages of investigation and/or cleanup:
    - General Guidance
    - Release Reporting
    - Soil Excavation and Treatment
    - Site Investigation and Risk Evaluation
    - Corrective Action

  Amec Foster Wheeler has conducted projects following PRP guidance in all groups identified above. We understand that the consultant guidance for UST/AST release cleanup presents a streamlined, risk-based approach to petroleum investigation and cleanup. Low-risk sites that can demonstrate the ability to naturally attenuate can be quickly closed. High-risk sites that can potentially impact a receptor are thoroughly assessed and quickly cleaned up to mitigate the impact.
- **Petrofund** – The Minnesota Legistlature established the Petroleum Tank Release Cleanup Fund (Petrofund) in part, to provide a financial incentive for responsible parties to investigate and cleanup petroleum releases in a timely manner so that they do not increase the severity of the impact. The Petrofund program is governed by Minnesota Statue (115c) and Minnesota Rule 2890 and is administered by the Minnesota Department of Commerce. Petrofund allows eligible applicants (responsible parties or non responsible parties that hold legal or equitable title to the property where a release occurred) up to 90 percent of reasonable and necessary costs they incur in responding to a petroleum tank release (PRP, 2017). Amec Foster Wheeler has experience working through petrofund on more than 40 sites.

B.2.6 Experience Working with MPCA PRP as a Company

Amec Foster Wheeler has held the MPCA/MDA Level 3 Environmental Services contract since July 2008 and has had the opportunity to work with nearly 20 different MPCA project managers to support more than 180 different Work Orders during that time. As a result, we are intimately knowledgeable about the PRP policies, procedures, and protocols that govern project initiation, planning, execution, monitoring and controlling, and closing of projects. We have had the opportunity over the last 10 years to meet annually with the MPCA to discuss our performance and continue to strive for opportunities for continual improvement in executing the contract. This

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is a benefit to both the MPCA and MDA as we can immediately tackle new project work with little to no learning curve.

Our project team has conducted site investigation or remedial investigation activities involving petroleum releases across the state of Minnesota. Representative sites where our team followed PRP guidance are listed in **Exhibit 5.**

Exhibit 5. Petroleum Release Sites Project Experience

Site Name and Location	Site Name and Location
1016 Marquette Building Site Investigation, Mpls.	Jacobson Oil Bulk Site LSI, Bricelyn
2924 Bryant Ave South, Site Investigation, Mpls.	Java Detour LSI/RI, Rochester
912 W Lake St Site Assessment and Soil Vapor Investigation, Mpls.	John's Service LSI/RI, Alvarado
All-American Recreation RI, Tonka Bay	Maple Lawn Park (Cemetery), Faribault
Arnason Property, Site Investigation, Marine on St. Croix	Marvin Windows Phase II/RI, Warroad
Bank of America Soil and VI Investigation, St. Paul	Matt's Auto LSI, Moorhead
Canadian Pacific Balaton Railroad Corridor Phase II ESA	Melrose River View Addition Phase II/RAP, Melrose
Canadian Pacific Callaway Railroad Corridor Phase II ESA	MNDOT Little Falls Tank Removal, Little Falls
Canadian Pacific McFarland-Dworsky Remedial Investigation, Mpls.	MNDOT Trunk Highway 65 Phase II, Blaine
Canadian Pacific Otisco Yard Site Investigation	Monite Building LSI, Mpls.
Canadian Pacific Shoreham Yard Remedial Investigation	MSP International Airport SI, Bloomington
Canadian Pacific Sleepy Eye Rail Yard Phase II ESA	N Main Street Fridley SVI, Fridley
Canadian Pacific Springfield Rail Corridor Phase II ESA	New Ulm SA, New Ulm
Canadian Pacific Strandquist Rail Corridor Phase II ESA	Oasis Market 592 LSI/RI, Brooklyn Park
Canadian Pacific Tyler Railroad Corridor Phase II ESA	Oasis Market LSI/RI, Wells
Canadian Pacific Walnut Grove Rail Corridor Phase II ESA	Pigs Eye Landfill Waste Assessment, St. Paul
Dingly Residence LSI, Lyle	Polyfoam UST Closure, Lester Prairie
Duluth ANG Remedial Investigation	Quick Lube and Tune LSI, Moorhead
Fast Snowmobile Site Remedial Investigation, Eveleth	Rolling Hills Estates Phase II, Maplewood
Food N Fuel Phase II ESA, Winnebago	Royal Enterprises America Phase I, Stacy
Ford TCAP Decommissioning, St. Paul	S&D Cleaners SVI, St. Louis Park
Former Balsam Store LSI, Bovey	Schloff Chemical SVE/RI, St. Louis Park
Former Gas Station/Falcon Oil LSI, St. Louis Park	Super Shop Mankato LSI, Mankato
Former Harley's Gas Station LSI, Winona	The Depot Site Phase II/RAP, Hutchinson
Former Roy's Garage LSI, Winthrop	Union Pacific Chaska Lead Phase II/RAP, Chaska
Former Skluzacek Oil LSI/RI, Montgomery	Universal Plating Phase II/SVI, Mpls.
Former Soo Line Site Decommissioning, Mpls.	USPS UST Removal/Replacement, Mpls.

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Exhibit 5. Petroleum Release Sites Project Experience

Site Name and Location	Site Name and Location
Former Warroad Elementary School Site Investigation, Warroad	WAFTA/Nike MSP-70 Phase II/FFS, St. Bonifacius
Former Worden Crandall Auto LSI, Red Wing	Westling Manufacturing RA/SVI, Princeton
Hemlock Garage LSI, Duluth	Witt Property LSI, Waseca

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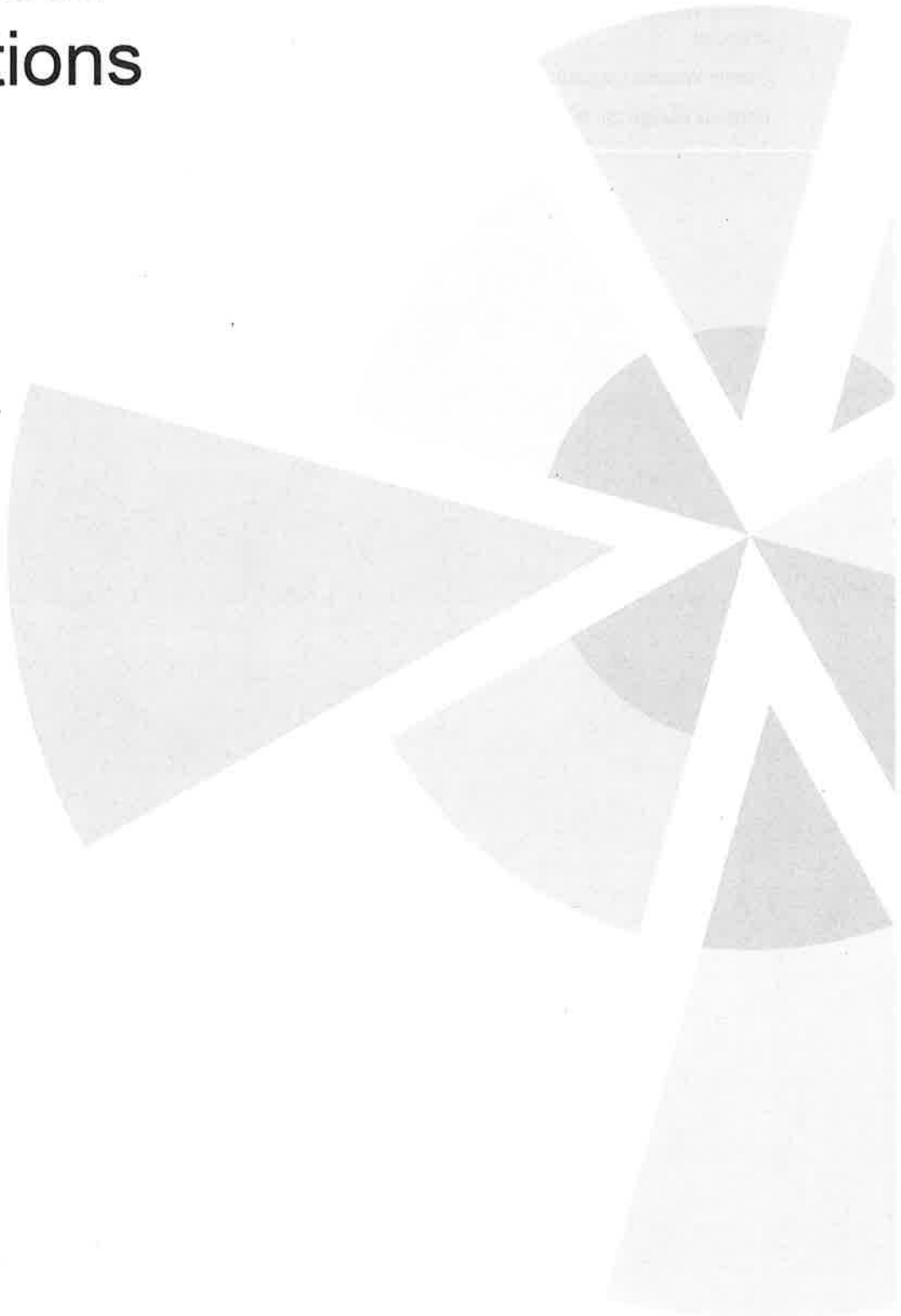
B.3 Project Descriptions



B.3.1 Remedial Investigation and Feasibility Study

Duluth Air National Guard Base
St. Louis County, Minnesota

amec foster wheeler

Client Name: National Guard Bureau

Client Contact: Mr. James King

Telephone: 240-612-8763

Period of Performance: 2015 - present

Site Description

Amec Foster Wheeler was contracted to conduct Remedial Investigations/Feasibility Studies (RI/FS) at two locations referred to as Area of Concern (AOC) sites at the 148th Fighter Wing (FW) of the Minnesota Air National Guard (MNANG) at the Duluth International Airport (DIA) in Duluth, St. Louis County, MN. The AOC sites were identified as a former fire training area (FTA) (AT028) and an aircraft hangar underground storage tank (UST) release (TU001).

The chemicals of potential concern (COPCs) identified at AT028 were per- and polyfluoroalkyl substances (PFAS) associated with the use of aqueous film forming foam (AFFF). Fire training activities were conducted at AT028 twice a month from 1960 until 1987. During that time, jet propulsion fuel #4, along with smaller volumes of contaminated fuels and oils, paint thinners, and solvents, were burned during fire training exercises and the fires were extinguished with AFFF.

The COPCs identified at TU001 include volatile organic compounds (VOCs), lead, total petroleum hydrocarbons (TPH) as both diesel range organics (DRO) and gasoline range organics (GRO). Historical records indicated that a 500-gallon gasoline UST was installed to serve an emergency fire pump generator.

Outcome Achieved

- PFAS plume in groundwater successfully delineated
- Obtained client approval on RI/FS Report – currently in review with the MPCA
- Successful coordination and negotiations with MPCA to determine appropriate sampling locations, media and boundaries
- Preparation of the first PFAS Feasibility Study for the ANG is currently in preparation.

Relevant Agencies, Regulations

- MPCA
- MDH
- USEPA
- CERCLA Remedial Investigation

Tasks Subcontracted Out

- Environmental Drilling – Midwest Drilling
- Laboratory Analysis – Vista Analytical
- IDW disposal – Stevens Environmental
- Private Utility Locates – National GPR
- Registered Land Surveying

Personnel

- C. Vowles – Task/Field Manager
- J. Renier – Regulatory Specialist
- J. Gal – Project Engineer
- S. Thomas – SME – PFAS

Project Description

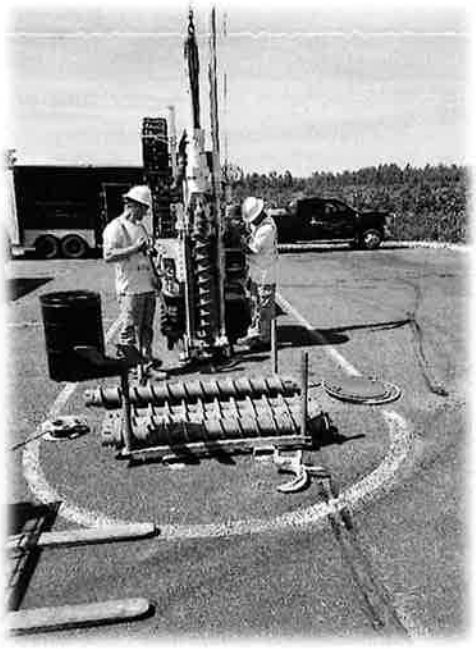
The overall objectives of the RI/FS project were to (1) delineate the nature and extent of COPCs in both soil and groundwater and to conduct a limited soil vapor investigation relative to the UST release AOC, and (2) develop a path forward for the delineated sites with either recommended future remedial activities via a feasibility study, or recommended NFA status via a decision document.

Work plans, including field sampling plans (FSPs), health and safety plans (HASPs) and UFP-quality assurance project plans (QAPPs) were first developed and approved by the ANG and MPCA.

Field work was carefully coordinated with multiple stakeholders (ANG, FAA/airport personnel, regulators, and base personnel) to minimize disruption to the installation and ensure that all appropriate permits were obtained and approved prior to drilling activities.

Field investigation activities at AT028 were conducted following a staged approach. The first stage consisted of drilling soil borings and temporary monitoring wells using direct push technology (DPT), and sampling soil and

groundwater for PFAS. The borings/temporary monitoring wells were drilled at locations in an attempt to characterize the source area. Two additional phases of step-out sampling were required to delineate the PFAS plume including installation of seven permanent monitoring wells using hollow-stem auger (HSA) drilling methods. Amec Foster Wheeler also conducted sediment sampling for PFAS which included collecting samples from catch basins in the vicinity of the AOC.



RI activities at TU001 included drilling of soil borings and installing five permanent monitoring wells using HSA technology. Soil and groundwater samples were analyzed for the COPCs (VOCs, lead, TPH-DRO and TPH-GRO).

Monitored natural attenuation (MNA) parameters were also collected during RI activities to provide additional site information for proposed remedial design.

Monitoring wells were constructed in accordance with Minnesota Department of Health (MDH) rules. The wells were developed in accordance with our standard operating procedures incorporating MPCA guidance.

Additional activities performed included aquifer testing (slug testing), soil boring and temporary well sealing, surveying and management and disposal of investigation derived waste (IDW). RI reports were prepared and submitted to the MPCA. Based on results of the RI, a FS is currently in development for AT028 that evaluated several alternatives including groundwater extraction and treatment, excavation, permeable reactive barrier (PRB), hydraulic containment and others.

Project Highlights

- Delineated PFAS contamination in soil and groundwater and currently developing the first PFAS FS for the ANG.
- Obtained client approval on RI/FS Report.
- Close collaboration with MPCA during scope of work development and results analysis. MPCA provided guidance and approval on boring and monitoring well locations, sampled media, and potential path(s) forward toward remediation alternatives.

B.3.2 Remedial Investigation

Confidential Manufacturing Client Site
Roseau County, Minnesota

amec foster wheeler

Client Name: Confidential

Client Contact: Brad Baumann

Telephone: 218-386-1430

Period of Performance: 2002 to Present

Site Description

The Site is a manufacturing facility where soil, groundwater, surface water and sediment have been impacted by chemicals of potential concern (COPCs) associated with wood preservation/treating and other plant operations. The COPCs include pentachlorophenol (PCP), mineral spirits, and some chlorinated and non-chlorinated volatile organic compounds (VOCs). The Site is located in a topographically flat area on fill and glacial lake clay and silt deposits adjacent a municipal drainage ditch which flows to a lake situated approximately 0.6 miles northeast (downgradient) of the Site.

The Site contains two areas of concern including the facility main process building and a former boiler ash area. Soil and groundwater became impacted with PCP and mineral spirits due to leakage from a former wood treatment process dip tank, USTs, and product circulation lines. These COPCs have migrated downgradient from the main process area in groundwater toward the drainage ditch and lake via groundwater flow and through drainage culverts that intercepted the water table and discharged to the ditch. The boiler ash area became impacted by VOCs associated with solvents that leaked from drums buried at this location and by PCP and mineral spirits that were transported to this site in fill obtained from other portions of the facility.

Currently the Site has a monitoring network consisting of 16 monitoring wells and five established surface water sampling points. It also has an active groundwater pump and treatment system consisting of five groundwater extraction/recovery wells, a bioreactor and carbon polishing system in the main plant process building.

Outcome Achieved

- Remedial Investigations and remediation at Sites A and B have served to characterize the nature and extent of contamination on and off-Site, protect groundwater and surface water quality downgradient from the Sites and have moved the Sites toward closure.

Relevant Agencies, Regulations

- Resource Conservation and Recovery Act (RCRA)
- MPCA Risk-Based Characterization and Sampling Guidance
- MPCA Surface Water Pathway Evaluation Users Guide – Working Draft (January 30, 2006)

Tasks Subcontracted Out

- Drilling and Soil Boring/Well Installation
- Soil and Drum Excavation
- Geophysics
- Culvert and Soil Removal
- Laboratory Analytical
- Waste Hauling and Disposal

Personnel

- J.Renier – Project Manager / Hydrogeologist
- E. Driver – Data Manager
- D. Barsotti – Risk Assessor
- M.Vavra – Field Technician
- M.Bevier – QA/QC Officer

Project Description

Remedial Investigation (RI) activities are being performed under Resource Conservation and Recovery Act (RCRA) guidance in accordance with a consent decree issued by the Minnesota Pollution Control Agency (MPCA). Remedial activities that have been conducted include soil boring and monitoring well installation and sampling, regularly scheduled groundwater and surface water quality monitoring, recirculation line excavation and removal, installation and operation of a groundwater pump and treat system, drainage culvert removal and drum and impacted soil removal and treatment. Current site activities include continued monitoring and assessment of

impacts to the drainage ditch that borders the Site. The ditch is the primary ecological receptor driving site investigation activities at this time.

Descriptions of the primary investigations and remedial measures are as follows:

- **Groundwater/Surface Water Investigations.** Groundwater/Surface water investigations have been conducted in the main process area to determine if PCP and DRO detected above surface water criteria in the drainage ditch were entering the ditch via groundwater flow and/or culvert water discharging to the ditch. This includes installation and sampling of a series of temporary monitoring wells, chemical fingerprinting for DRO, surface water runoff, groundwater, and culvert sampling.
- **Conduit/Culvert and Soil Remediation**. As a result of the groundwater/surface water investigations, a remedial effort that involved excavation and removal of 450 ft of drainage culverts and approximately 135 cubic yards of surrounding impacted soils in the main process area was conducted and has been followed by monitoring ditch surface water to confirm that levels of PCP and DRO decrease to and remain below surface water criteria.
- **Geophysical Survey.** A geophysical survey consisting of an electromagnetic metal detection (EM61) survey and an electromagnetic ground conductivity (EM31) survey was conducted across the boiler ash area. This was employed to determine if buried drums and/or trenches were present and were potentially the source of continued detections of VOCs in groundwater at levels above surface water criteria in downgradient sentinel wells adjacent the ditch. These surveys determined the locations of anomalies as possibly containing buried drums and/or other metallic debris.
- **Soil Gas Survey.** A passive soil gas (PSG) survey was conducted across the boiler ash area using an array of 74 samplers laid out in a 10 foot sampling grid. Samplers were analyzed for VOC's and total petroleum hydrocarbons (TPH) based on a GRO standard. This survey identified multiple areas containing elevated soil gas levels for VOCs and TPH.
- **Trenching Investigation/Remediation.** Amec Foster Wheeler conducted a series of trenches to investigate the geophysical anomalies and soil gas survey hotspots identified in the geophysical and soil gas surveys conducted at the boiler ash area. A total of 21 drums in varying condition were uncovered and removed from one of the trench/pits and approximately 223 yards of soil were removed from the trenches and disposed off-site. An Oxidant EHC-O™ was applied to soils remaining in the trench that contained the drums.
- **Soil Gas, Soil, and Groundwater Investigation.** Based on continuing criteria exceedances found in groundwater at the boiler ash area, Amec Foster Wheeler conducted a second PSG survey using an array of 40 samplers laid out in a modified 10 foot sampling grid, and analyzed for a limited list of VOCs. Based on the results of the second PSG survey, 23 soil borings, along with five temporary wells along the edge of the ditch were installed and sampled for VOCs. The results of these surveys will be used to guide further excavation and remediation efforts at the site.

Project Highlights

Amec Foster Wheeler was able to use the groundwater/surface water investigation and the fingerprinting study at the main process area to show that the COPCs reaching the drainage ditch originate primarily from water travelling through drainage culverts/conduits that discharge to the ditch. This set the stage to develop a work plan for further remediation which involved the removal of the existing drainage culvert system and surrounding impacted soils at the main process area. This action decreased the concentrations of PCP and DRO in ditch water to levels below surface water criteria and have moved the site toward closure.

The geophysical and soil gas surveys conducted at the boiler ash area served to "pinpoint" the locations of buried drums and soil contamination for the trenching investigation. The trenching investigation at the boiler ash area removed a significant amount of impacted media and resulted in some reduction of COPCs in groundwater at the downgradient site monitoring compliance point wells. Additional remediation is being planned to move site toward closure.

B.4 Scope of Services

B.4 Scope of Services

B.4.1 Scope of Services Experience Summary

Amec Foster Wheeler's experience with each of the bullets listed in Section 3, Category B. Petroleum Only Environmental Services of the RFP is presented below.

Our proposed project team has experience with each of the bullets listed in Section 3, Category B. Petroleum Only Environmental Services of the RFP. Our experience with each of the bullets listed in the RFP is presented below and compared to key Amec Foster Wheeler personnel in **Exhibit 6** at the end of this section. We have also included a key below detailing each scope of services element and where it is located within this section.

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Oversee site investigation services for soil boring advancement, and monitoring well installation using both standard drilling methods, and direct push methods

Amec Foster Wheeler staff has vast experience overseeing and completing subsurface investigations across Minnesota. Over the past ten years working with the MPCA/MDA on the Level III Technical and Professional Services contract, Amec Foster Wheeler has safely conducted drilling oversight for thousands of soil borings, monitoring wells and soil vapor probes completed on behalf of the MPCA. A variety of drilling methods, including hollow stem auger (HSA) and direct push, have been utilized in these efforts. Amec Foster Wheeler has also conducted investigation projects across Minnesota using mud rotary, air rotary, rotosonic, and membrane-interface probe (MIP) methods.

Amec Foster Wheeler understands the importance of collecting data using the most appropriate technology, not only to provide technically sound data but also to prevent unnecessary costs of multiple mobilizations by selecting inappropriate technology. As such, our experienced staff review existing geologic data and available well logs to evaluate site hydrogeologic conditions as part of our project planning and conceptual site model development. Our work plans account for the effect of soil type, depth to bedrock, and the anticipated vertical extent of soil and groundwater impacts on the selected drilling approach and methods.

Many project sites require Amec Foster Wheeler to utilize multiple drilling methods to adequately characterize subsurface conditions. Amec Foster Wheeler typically utilizes push probe methods to provide accurate delineation of soil type and vertical and horizontal extent of shallow contamination such as during evaluation of petroleum releases as part of Limited Site Investigations, while HSA drilling methods are more efficient for installing permanent monitoring wells and vertical aquifer sampling. The HSA approach is well-suited for the common situation where sand lenses or contaminant pathways need to be identified accurately.

Representative Experience

Amec Foster Wheeler has provided remedial investigation and groundwater monitoring services at Canadian Pacific's Shoreham Yard Facility located in Minneapolis, Minnesota since 2001. Since that time, Amec Foster Wheeler has completed drilling and sampling of hundreds of soil borings and monitoring wells using various

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drilling methodologies. Amec Foster Wheeler's conceptual site model included the following hydrogeologic horizons: 1) shallow groundwater horizon (unconsolidated fill, alluvium, till, outwash); 2) intermediate groundwater horizon (Ordovician St. Peter Sandstone [sandstone unit]; 3) deep groundwater horizon (St. Peter Sandstone [mudstone unit]; and 4) underlying bedrock Ordovician Prairie du Chien Group (dolomitic formations, Shakopee Formation and underlying Oneota Dolomite). A buried bedrock valley, filled with outwash deposits incised through the St. Peter Sandstone and Oneota Dolomite, was identified east of the Site trending northeast to southwest. Groundwater was generally encountered at depths ranging from 30 to 50 feet below ground surface in all groundwater horizons. Based on this conceptualization, Amec Foster Wheeler evaluated the most appropriate method for drilling (rotosonic, hollow-stem auger, direct-push, etc.) and completed soil borings and monitoring wells based on the geology. Amec Foster Wheeler provided oversight for drilling over 150 monitoring wells and 400 soil borings at depths ranging from approximately 10 to 280 feet below ground surface.

Conduct ground water, soil, surface water, sediment, and air sampling and monitoring

Groundwater sampling and monitoring - Amec Foster Wheeler staff is experienced at collecting groundwater samples and monitoring groundwater conditions. Groundwater samples are collected in accordance with MPCA Guidance Document 4-05 *Groundwater Sample Collection and Analysis Procedures* (March 2017) and/or with MDA Guidance Document GD12 *Groundwater Sampling Guidance* (Rev 3/17) as applicable. When applicable, Amec Foster Wheeler staff collects field natural attenuation data in accordance with MPCA Guidance Document 4-03 *Assessment of Natural Biodegradation at Petroleum Sites*.

When groundwater sampling at petroleum sites, we generally utilize Teflon or disposable bottom-filling bailers, dedicated sampling pumps, or a low-flow (e.g. Redi-Flow2) submersible pump with dedicated sampling tubing. Generally, three to five wells volumes are removed and field parameters are stabilized before sampling occurs. We are experienced with the low-flow groundwater sampling techniques. We use owned equipment to monitor and record field parameters, including pH, specific conductivity, temperature, redox potential, and dissolved oxygen.

Amec Foster Wheeler has been a leader in evaluating and implementing passive diffusion bag samplers for long-term groundwater monitoring at RCRA corrective action and superfund sites impacted by VOCs. The use of bag samplers has been shown to improve the efficiency of long-term monitoring programs, particularly where the monitoring networks are large and/or include deep wells.

Soil collection and monitoring - Nearly all our projects involve some type of soil sampling. Consequently, Amec Foster Wheeler staff has vast experience collecting soil samples during the performance of site investigation or clean-up efforts. Soil samples are collected using split spoon methods, conventional drilling techniques, macro-core samplers, hand augers, soil stockpiles, test pits and trenches. All project work conducted under the MPCA/MDA contract follows applicable sampling guidance such as MPCA PRP 4-04 *Soil Sample Collection and Analysis Procedures* dated March 2017 and MDA Guidance Document *Soil Sampling Guidance* GD-11 (Rev 7/11).

Surface water sampling and monitoring - Amec Foster Wheeler's staff collects surface-water samples to assess potential contaminant plume discharges to rivers, lakes and streams. Additionally, surface water sampling is utilized to determine whether storm water or treated water has been discharged to nearby surface waters. Site specific limitations dictate the sampling technique and equipment, such as bottles, bomb samplers, and dip samplers. Amec Foster Wheeler staff have direct experience with remote monitoring of surface water parameters through telemetry based probes for temperature, pH, nitrates, flow, conductivity, dissolved oxygen, phosphorous and turbidity. Amec Foster Wheeler implements industry accepted SOPs for the careful collection of surface water samples and adheres to them in all cases, taking into account any requirements of the applicable regulatory body in which we serve.

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Sediment sample collection and monitoring - Amec Foster Wheeler collects sediment samples to track plume migration and to evaluate the migration and deposition of impacted sediments/soil particles into a waterway. Sediment samples are collected from stream, river, wetland and lake beds using a variety of tools and techniques. Some shallow samples are collected utilizing hand boring tools while deeper samples may require sampling off a barge, or through the ice, using a discrete sampler. Sediment sampling protocol is determined after review of existing information concerning the depth of the targeted waterway. Amec Foster Wheeler implements industry accepted SOPs for the careful collection of sediment samples and adheres to them in all cases, taking into account any requirements of the applicable regulatory body in which we serve.

Air sample collection and monitoring - Amec Foster Wheeler staff collects indoor/outdoor air samples as part of Vapor Intrusion Assessments (VIA) as well as subsurface soil vapor and sub-slab samples, all utilizing SUMMA® canisters and Tedlar bags. The SUMMA® canisters are used for either discrete samples or time-weighted averages. Additionally, Amec Foster Wheeler collects air samples to assess remediation system (i.e., AS/SVE) effectiveness and effluent treatment effectiveness. SVE and air stripper systems have the potential to discharge VOCs at levels above significant emission rates, and Amec Foster Wheeler monitors and reports these conditions and designs and implements treatment (e.g., GAC) where needed. All project work conducted under the MPCA/MDA contract follows applicable sampling guidance such as MPCA PRP 7-09a *Air Emission Controls* dated January 2011, MPCA PRP4-01a *Vapor Intrusion Assessments Performed during Site Investigations* dated October 2010, and *MPCA Sub-Slab Sampling Methodology* Video, published January 2018.

Representative Experience

- As part of a recent site investigation portfolio assessment for the Air Force, Amec Foster Wheeler completed Preliminary Assessments (PAs) to identify suspect releases of PFASs from the use of AFFF and then completed Site Inspections (SIs) as a result of AFFF usage at 118 potential release areas across 22 installations. We performed PAs at 39 installations in 19 states and SIs at 22 installations in 13 states. Groundwater, soil, sediment, surface water, drinking water and effluent samples were collected and defensible data was generated using standardized methods and procedures as per our project-specific QPP and PFAS-specific SOPs. The data, along with the results of private and public well surveys and inventories that we conducted, was foundational information required to identify areas downgradient where there may be a complete exposure pathway for drinking water.
- As part of an ongoing soil remediation project located in St. Paul, Minnesota, Amec Foster Wheeler was recently required to collect surface water samples from open excavations. The surface water was potentially contaminated with VOCs, SVOCs, metals and polychlorinated biphenyls (PCBs) and needed to be characterized prior to disposal to ensure that the water characteristics met the MCES special discharge criteria. Discrete surface water samples were collected into laboratory provided unpreserved sample containers via submersion and subsequently transferred into preserved containers. Several locations were inaccessible and therefore surface water samples were collected using a decontaminated dipper attached to an extension rod. Select parameters such as pH were measured on-site with a meter.

Conduct vapor/air monitoring for health and safety and air quality criteria

Amec Foster Wheeler staff has experience providing vapor/air monitoring on a variety of impacted properties utilizing hand held or fixed dust meters, photoionization detectors, organic vapor monitors, explosimeters, and draeger tubes. We also utilize air flow measurement devices, such as inclined water manometers and digital anemometers to evaluate the effectiveness of SVE systems. Specific site conditions dictate the type of air monitoring required. Prior to site mobilization, Amec Foster Wheeler evaluates known site conditions and selects the appropriate air monitoring protocol and equipment.

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Conduct and/or oversee site assessment activities (Phase I and Phase II), limited site investigations and remedial investigations

The performance of Phase I, Phase II, limited site investigations and remediation investigations along with site remediation, is the core practice area of the Minneapolis Amec Foster Wheeler office and has been for nearly 20 years. In the past 10 years of holding the MPCA/MDA Level III contract, Amec Foster Wheeler has conducted over 200 site assessments, including Phase I Environmental Site Assessments (ESAs), Phase II ESAs, Limited Site Investigations (LSIs), site assessments, and remedial investigations (RIs).

Amec Foster Wheeler conducts Phase I Environmental Site Assessments (ESAs) in accordance with the ASTM International (ASTM) guidance E1527-13 and the USEPA final rule for All Appropriate Inquiries. The purpose of the Phase I ESA is to evaluate the presence or potential presence of recognized environmental conditions (RECS), including historical RECs (HRECs) and controlled RECs (CRECs). Following completion of a Phase I ESA, Amec Foster Wheeler develops a Phase II scope of work to determine if the RECs have impacted the environment at the site. In proposed redevelopment projects, the Phase II scope of work will also incorporate the planned redevelopment and land use to ensure that appropriate data quality objectives are considered. Amec Foster Wheeler also has extensive experience preparing response action plans (RAPs) in accordance with the RBSE process and both MPCA and MDA guidance. For Superfund and RCRA Corrective Action projects, we follow the guidance for those programs and follow the National Contingency Plan.

Representative Experience

- Melrose Riverview Development: Environmental Site Investigation & Remedial Action Planning: Amec Foster Wheeler conducted ESA activities at the Melrose River View Addition located in the city of Melrose, Stearns County, Minnesota. The project was completed for the City of Melrose under contract to the MPCA and funded under the Minnesota Targeted Brownfield Assistance Program (MNTBAP) through a USEPA 128(a) grant. The Melrose River View Addition property was developed for industrial processes dating back to the 1890s and included a grain and flour milling operation and a food processing plant that utilized railroad transportation. The City of Melrose purchased the Site in 1994 and planned to redevelop the property as a mixed use residential/commercial development with some parking and recreational space. Amec Foster Wheeler conducted a Phase I ESA and identified a series of RECs that were subsequently investigated in a multiple-stage Phase II ESA. Specifically, the Phase II ESA was conducted to investigate potential contamination associated with three former leaking USTs, contaminated fill material that was placed during and after demolition of the former Site structures, and potential contamination associated with historical railroad operations at the Site. Phase II investigation activities included the drilling and sampling of soil borings, installation and sampling of soil vapor probes, and installation of groundwater monitoring wells. Contaminants of concern included CVOCs, TPH and metals. Based on the findings of the site investigation activities, Amec Foster Wheeler developed a remedial action plan. Alternatives considered included: institutional controls (capping), excavation, in-situ soil treatment, groundwater pump and treat and groundwater monitored natural attenuation.
- Focused Site Investigation, Confidential Manufacturing Facility, Hennepin County, Minnesota: Amec Foster Wheeler conducted a time-sensitive soil and groundwater investigation to determine through environmental media sampling, if an accidental release of AFFF from an on-site fire suppression system had impacted the soil and/or groundwater at the site. The investigation was conducted in accordance with MPCA RBSE guidance and in general accordance with the United States Army Corps of Engineers (USACE)

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Interim Guidance on the Assessment and Management of PFAS. Investigation activities consisted of utility clearance, drilling soil borings and installing monitoring wells using a combination of push-probe and hollow stem auger drilling methods, soil and groundwater sampling, surveying, investigation derived waste management, and well sealing. All investigation activities were conducted in accordance with Amec Foster Wheeler SOPs for sampling PFAS, to prevent cross-contamination from materials used and/or sampling activities. The incident was managed by the MPCA Emergency Management Unit.

Conduct surface water, ground water, air and vapor receptor surveys

Amec Foster Wheeler staff is experienced with conducting surface water, groundwater, air and vapor receptor surveys. These include walking surveys and identifying water wells, working with City officials to confirm utility locations, construction and connections, drilling borings in utility backfill trenches, vapor monitoring in sewers and basements, collection of water samples from sewer manholes and at treatment plants, and collection of sub-slab soil vapor samples. These activities are required at nearly all our projects as part of the RBSE process. We use this information, along with current and planned land use information, to inform and frame the investigation and remediation work plans and response action plans that we prepare.

Representative Experience

For Former All American Recreation Site (LS 19042). Amec Foster Wheeler conducted a comprehensive receptor survey as part of an environmental investigation conducted at the former All American Recreation site under Leak Site #19042. The Site is located approximately 400 feet west of the edge of Lake Minnetonka and is in a residential/commercial area. The receptor survey included an assessment of properties within 500 feet of the site via a walking survey supplemented with preparation and mailing of questionnaires to property owners. The questionnaire was developed to determine the presence of water supply wells or confirmation of connection to public water supply, well usage (as applicable), presence of basements/sumps, possible petroleum sources and any other property specific comments. The receptor survey also included a review of the MDH county well index as well as wellhead assessment areas for drinking water receptors within ½ mile of the site, assessment of nearby surface water receptors, and determination of presence and relevant construction details of underground utilities. An added challenge for the site was the fact that it sits on the edge of the boundary between the cities of Shorewood and Tonka Bay, and a Metropolitan Council sanitary sewer line was present to the south of the site. A sewer vapor survey was conducted in the sewer to evaluate the potential presence of hazardous vapors since the sewer line potentially served as a conduit to residential property along the lake.

Oversee construction to mitigate vapors and conduct non-construction mitigation measures such as using fans, etc.

Amec Foster Wheeler oversees the construction of vapor mitigation measures as necessary. Generally, non-construction vapor mitigation efforts are required along storm and sanitary sewer systems or as interim measures until a permanent vapor mitigation system can be constructed. Amec Foster Wheeler staff has training and design and construction experience with the design of ventilation systems, both for specific unit manufacturing operations and for area-wide mitigation of contaminant vapors such as those associated with contaminated soils or vapor migration into building spaces. This work has included below grade spaces on an interim basis and for above grade spaces on a long-term on-going basis.

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With an increasing knowledge of the prevalence and long-term effects of soil vapors intruding into living spaces, the need for vapor mitigation systems has grown exponentially in recent years. Amec Foster Wheeler has made it a priority to understand the evolving science behind vapor intrusion and the techniques available to limit the impacts to the both the general population and surrounding environment. Amec Foster Wheeler is adept at incorporating any new guidance towards the issue of vapor intrusion, from assessment phases through to the mitigation phase.

As part of the construction oversight process, Amec Foster Wheeler also understands the importance of educating the property owners of the ramifications of having an SSDS installed in their home. In response to that need to share information with the property owners, Amec Foster Wheeler takes every opportunity to communicate through each step of the process, so that the property owner gains understanding and is less anxious about the prospect of maintaining the SSDS. This is an opportunity to add value to each of the installations we provide oversight on, as it will likely increase the operational lifetime of the systems, thus decreasing the annual cost.

Representative Experience

Former Waldorf Cleaners, Minneapolis, MN: Amec Foster Wheeler is currently overseeing the construction of a vapor mitigation system at a residential home at the Former Waldorf Cleaners property in Minneapolis, MN. The home presents a wide array of construction types (slab on grade, crawl space, and basement), making the design of the SSDS more intricate. Amec Foster Wheeler understands the need to conduct a comprehensive evaluation of all elements involved in vapor mitigation in individual structures to ensure that the SSDS design includes all technical and regulatory requirements and to avoid any slowdowns during system construction.

Operate and Maintain Remediation Systems

Amec Foster Wheeler staff has extensive experience operating and maintaining both soil, soil vapor, and groundwater remediation systems. Once remediation systems become operational, it is our goal to maintain equipment function and find opportunities to maximize system effectiveness and minimize operational costs. To that goal, we maintain accurate system records, perform routine maintenance, and continually review operational costs.

Amec Foster Wheeler also reviews routinely collected monitoring data to assess the need for system enhancements to shorten the time the remedial system needs to remain in operation, recognizing that it is in the best interest of the environment to leverage environmental dollars to the sites where they are most needed.

Another important aspect to system operation is troubleshooting problems to minimize down time. Amec Foster Wheeler has the ability to quickly determine system components that require rehabilitation, repair or replacement, and getting the correct parts and/or contractors on-site to get the system back to operational status.

Representative Experience

- Confidential Manufacturing Facility (Superfund Site), Hennepin County, MN: Members of our proposed project team designed and conducted construction oversight of a groundwater extraction and treatment system (GWETS) installed to address groundwater contaminated with CVOCs, specifically TCE and breakdown products. Prior to commissioning, several permits were obtained, including a Minnesota Department of Health (MDH) well appropriation permit with pumping limits for each well not to exceed between 15-49 gallons per minute (gpm) and a Metropolitan Council Environmental Services (MCES) Industrial Discharge permit which specifies the conditions that the discharged water must meet. Amec Foster Wheeler completed several weeks of system commissioning, which required 24-7 technical staff availability to continually evaluate system performance and properly integrate mechanical, electronic, and remote monitoring functions until an ideal operating state was achieved. Throughout this process, Amec

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Foster Wheeler's technical on-site staff and engineering team developed an operation, maintenance and monitoring (OM&M) plan containing a sampling plan as well as 32 standard operating procedures (SOPs) specific to the system and its components that ensure successful operation and maintenance of the system and compliance with the MDH and MCES permits. Amec Foster Wheeler has also provided training for an OM&M contractor and continues to review system operation.

- Remedial System Design and O&M, Benton Harbor, MI: On behalf of the Michigan Department of Environmental Quality (MDEQ), Amec Foster Wheeler designed and installed a groundwater collection and treatment system at an abandoned chrome and cadmium plating facility in Benton Harbor, Michigan. The purpose of the system was to prevent migration of groundwater contaminated with VOCs and chromium to sensitive receptors downgradient of the Site. Amec Foster Wheeler designed an iron co-precipitation process to remove the chromium with a GAC polish. The treatment system was designed with a 99% chromium removal rate and treated water was discharged to the local wastewater treatment plant (WWTP) by permit. Following successful construction of the groundwater treatment system, Amec Foster Wheeler has conducted oversight of the O&M contractor. Tasks involve monitoring system effectiveness, verification that treated water is discharged in accordance with the WWTP requirements, troubleshooting, review of contractor deliverables and payment requests.

Arrange for transportation, storage, and proper management of wastes

Amec Foster Wheeler has coordinated the transportation, storage, and proper disposal of many types of waste. This includes impacted soil, groundwater, free product, spent carbon, and other impacted waste materials or solid, liquid and hazardous wastes. (e.g., abatement and demolition materials). Because this issue arises on nearly all our projects, we are very familiar with the applicable waste disposal rules including rules regarding restricted waste and asbestos-containing materials. Several of our local employees are intimately knowledgeable of the proper management of waste. Mr. Bob Marxen, PE, CHMM is both a Certified Hazardous Materials Manager and certified by MnDOT in waste handling.

Representative Experience

Ford Motor Company – Regulated Materials Management & Contractor Oversight: Amec Foster Wheeler provided environmental management, demolition oversight and regulated materials planning and disposal throughout the decommissioning and demolition of the two million-square-foot vehicle assembly plant in St. Paul, Minnesota. Amec Foster Wheeler's involvement in the project also included concrete reuse planning and volume estimation; stormwater pollution prevention planning; and remediation contractor oversight throughout the remediation phase. Amec Foster Wheeler worked with Ford's waste management contractor to characterize waste streams through sampling, approve profiles, sign manifests and shipping papers, and assist with waste tracking. Over 20 waste streams and 20,000 loads have been generated during the project.

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Evaluate the need for and oversee the implementation of alternative drinking water supply, including point-of-use treatment (i.e. filtration)

Amec Foster Wheeler has completed well surveys at more than 1,000 residences and has sampled over 300 residential wells to evaluate the need for alternative drinking water supplies. Amec Foster Wheeler has provided bottled water provisions for more than three dozen homes and has installed Point-of-Entry treatment systems. Amec Foster Wheeler has experience evaluating the need for, and overseeing the implementation of, alternative drinking water sources for both personal and business end users. Amec Foster Wheeler can evaluate the total usage required and geologic setting before determining whether supplied bottled water or individual point-of-use treatment (e.g., carbon filtration) is required. A complete understanding of the subsurface conditions is important in making this determination. Amec Foster Wheeler has the in-house capability for designing and specifying alternative water supply systems.

Representative Experience

As part of a portfolio assessment, site investigations at 28 installations across 13 states at 244 potential AFFF areas have been in progress since July of 2016. As a result of data collected to date, follow-on activities have been initiated at three installations. At one site, step-out investigations have been conducted. At a second site, conceptual designs for two source wells to be used for drinking water have been completed. At a third site, a larger, complex mitigation response was required as a result of initial data collected at the fire training area and subsequent data. The activities conducted included: performed three phases of step out sampling to better understand the extent of groundwater impacts; sampled public and private drinking water wells (60 locations); coordinated and distributed bottled water to 19 residences with private drinking water wells; supported distribution of approximately 115,000 gallons of water to the affected residences and businesses. Public meeting support was also required with the production of 6 posters and 7 handouts, coordinating meeting notices in local newspapers; participating in planning and preparation meetings; and providing technical experts at the meeting to answer questions from the public. Mitigation activities were also required and included: developed a conceptual design report for two mitigations systems to treat drinking water for three municipal wells; and evaluated 18 residences for the installation of whole house treatment systems or connection to municipal drinking water.

Coordinate and cooperate with other State-contracted services such as sampling and analytical, emergency response contractors, and hazardous waste services

As a Level III Technical and Professional Services contract holder with the MPCA/MDA since 2008, Amec Foster Wheeler has extensive experience coordinating and working cooperatively with other State contracted services, with approximately 90 percent of our projects conducted over the past ten years requiring the use of other state contractors (laboratory analytical or hazardous waste services). Amec Foster Wheeler understands that environmental projects are executed most efficiently when all stakeholders work in cooperation as a team throughout the project. State-contracted service providers will be included in the team and function with Amec Foster Wheeler to deliver a seamless, focused, solution to MPCA and MDA projects. Amec Foster Wheeler has worked for many years on projects that utilize a wide range of subcontractors and teaming partners, many of which are State of Minnesota Contractors that serve the MPCA and MDA. The familiarity that State of Minnesota Contractors have with the proper procedures and methods called for under the state contracts, brings value to each project. Amec Foster Wheeler staff are well versed in the use of the MPCA Contractor and Subcontractor Purchasing Manual and associated forms (e.g. State Contract Order Form [SCOF]) and ensure that all state contracted services are managed under the established protocols.

Arrange for geophysical activities

provide a cost effective, accurate delineation of buried features and objects such as bedrock depth, bedrock type, fractures and preferential pathways for potential contaminant plumes. We also have performed numerous subsurface surveys tor utility locations, underground storage tanks and piping. We apply our in-house geophysical expertise to assist in the design and optimization of remedial systems across the country. For example, Amec Foster Wheeler has reviewed geophysical reports regarding the location of shallow karst

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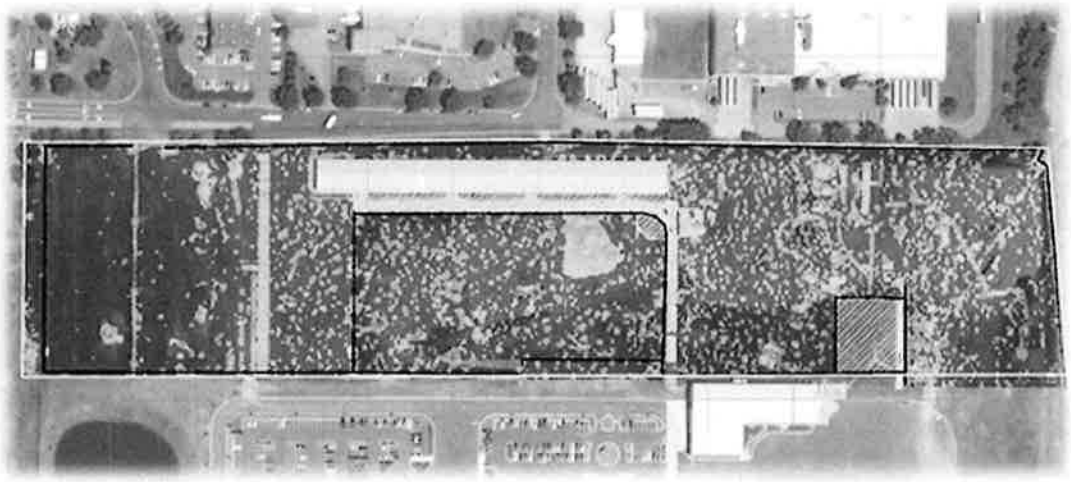
features controlling groundwater flow and LNAPL migration at petroleum release sites, and have targeted the location of LNAPL for recovery and groundwater monitoring efforts. We also have expertise utilizing borehole logging systems such as Natural Gamma, Resistivity and Video that may be useful to evaluate wells as part of remediation system maintenance programs.

Locally, Amec Foster Wheeler has several geophysicists on staff able to support several types of geophysical surveys. We have performed geophysical surveys to characterize subsurface geology, delineate contamination pathways, locate buried utility and infrastructure, and identify munitions and munitions debris. We are fully equipped to support surveys using Electromagnetic, Ground Penetrating Radar, Electrical Resistivity Seismic and Bathymetric tools. We have extensive experience in designing, conducting or overseeing, processing, producing geophysical maps and interpreting geophysical results. We have extensive software for geophysical mapping and processing (such as Geosoft Oasis montaj, Radan, and Earthimager and access to other licensed software used for geophysical data processing.

Representative Experience

Former Aerospace Manufacturing Facility, Fridley, MN: Amec Foster Wheeler conducted a time-domain electromagnetic geophysical survey at the former BAE systems facility to assist other consultants in locating suspected former drum disposal areas and to provide rationale in the placement of exploratory test pits being completed as part of a Phase II ESA (by others). Based on a previously completed Phase I Environmental Site Assessment (ESA) and an ongoing Phase II ESA, drums had previously been discovered and subsequently removed within various portions of the Site.



Oversee subcontractors and state contractors during investigation and cleanups and tank removals

Amec Foster Wheeler is experienced in overseeing subcontractors to ensure the work they perform conforms to the agreed-upon scope, schedule, cost, plans and specifications during all phases of environmental investigation. Amec Foster Wheeler staff oversight begins at the initiation of an investigation through coordinating utility locates and/or meets, where our staff stake proposed drilling locations in the field and coordinate with the drilling/excavation contractors to ensure that all activities will be free of utilities prior to the onset of drilling/excavation activity. Amec Foster Wheeler staff then provide guidance to subcontractors throughout a field investigation project, including completion of daily tailgate safety meetings, discussion of daily scope objectives and activities, oversight of drilling and decontamination measures, and standard operating procedures.

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Amec Foster Wheeler staff will also review daily records for state contractors and/or subcontractors and sign any documentation for verification of work conducted (as applicable).

Representative Experience

- Tank Removal and Environmental Oversight, Little Falls: Our project team conducted environmental oversight for removal of an on-site fueling system consisting of an 8,000-gallon diesel fiberglass UST (containing approximately 200 gallons of diesel), and associated dispenser, piping, and vent line. An approximately 600-gallon underground concrete vault that was previously used an overflow storm water containment structure was also removed. All tank removal activities were conducted in accordance with MPCA UST Program Rules 7150.0410 (Permanent Closure) and 7150.0420 (Site Assessment), and with MPCA guidance document c-prp3-01, Excavation of Petroleum-Contaminated Soil and Tank Removal Sampling dated March 2017. Amec Foster Wheeler conducted oversight and provided guidance for tank excavation and pumping contractors throughout the duration of the project. Specific tasks included: excavating soil from above the UST to uncover the access ports, pumping remaining diesel from the UST, excavation and cleaning of the UST, excavation of dispensers and associated piping, removal of stormwater vault, field screening and environmental sampling from excavation sidewalls and floor. Following excavation, clean fill was imported to the site and the excavation was backfilled.

- Tank Closure, Lester Prairie, MN: Our project team recently completed UST closure activities at a facility in Lester Prairie, McLeod County, Minnesota in accordance with MPCA UST Program Rules 7150.0410 for permanent closure and 7150.0420 Site Assessment. The UST was a 12,000-gallon fuel oil tank located beneath the concrete floor of the existing site building. Our team completed appropriate permits and notification in accordance with program rules. The UST was accessed through removing a portion of the concrete slab. The residual contents of the UST were pumped using a vac-truck and transported off-site for recycling by a licensed subcontractor. Vapor monitoring was conducted and then the UST was cleaned. Amec Foster Wheeler collected samples in accordance with MPCA guidance. Following receipt of analytical results, the tank was closed-in-place by a licensed subcontractor by filling the tank with inert material.

Prepare and evaluate reports (e.g., investigation reports, monitoring reports, free product recovery reports)

Amec Foster Wheeler understands that preparing and evaluating technical reports is an essential component of all MPCA and MDA projects, as it is for most of our environmental projects. Our clients find us to be excellent technical writers, capable of preparing clearly written, concise reports that are thorough and well-grounded in the data. Amec Foster Wheeler reviews and evaluates existing reports, providing informed recommendations for potential site activities. All activities directed or overseen by Amec Foster Wheeler will be documented in a report to MPCA or MDA utilizing appropriate guidance documents and forms where applicable. The report format will depend on the type of activity completed, and we are experienced with all the varying report formats and forms common to MPCA and MDA lead projects. Amec Foster Wheeler also conducts third-party reviews of investigation and remediation designs and reports and assesses technical issues, provides consultation regarding remedial approaches and optimization, and remediation strategy.

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Prepare Health and Safety Plans (HASP)

Safety is a critical element of our business and each employee understands it is their responsibility to make safety for themselves, and others, a primary concern. To strengthen our culture and reinforce our commitment to Health, Safety, Security and the Environment (HSSE) performance at all levels of the organization, Amec Foster Wheeler set out a standard health, safety, security and environmental approach and policy that is adopted by all businesses across Amec Foster Wheeler to ensure consistency across the company. At its most basic level, our policy provides us with a simple route map for establishing a unique HSSE culture within our operations. The HSSE policy requires that a site-specific Health and Safety Plan (HASP) is completed on every project before any on-site activity is initiated. Each HASP complies with OSHA standard CFR 1910.120.

Health, Safety, Security and the Environment Policy

amec foster wheeler

Purpose of this policy

To share and communicate our commitment to a workplace free from harm, through the prevention of injury, ill health, pollution and operational loss. This policy applies to all Amec Foster Wheeler global operations wherever they are carried out and is reviewed, and if necessary, revised annually as a minimum.

Commitment

The board is responsible for establishing the policy and for monitoring and reviewing overall HSSE performance and is committed protecting the environment and upholding our the value of 'Doing the right thing - putting safety first'.

We accomplish this through the protection and support of our employees and anyone working with us or affected by our activities, and our commitment to continuous improvement.

To meet our commitment

We recognise the right of our workforce to have a safe and healthy workplace and are committed to maintaining a strong and sustainable HSSE culture across all our operations through:

- Deploying the best leadership and management structure required to deliver this policy and to ensure a continuous chain of responsibility and accountability;
- Identifying and controlling the HSSE risks associated from our operational activities;
- Implementing systems for the management of HSSE, ensuring they are communicated and maintained in accordance with the Amec Foster Wheeler HSSE Management Framework;
- Fulfilling applicable HSSE compliance obligations (including legal and industry requirements);
- Establishing and monitoring clear HSSE performance objectives that include both leading and lagging indicators;
- Deploying robust processes for the investigation of incidents and captures, lessons learned to prevent similar events occurring;
- Monitoring and verifying our performance to ensure that the organisation is fully compliant with its standards, requirements and applicable legislation as a minimum;
- Implementing effective processes for workforce consultation and engagement at all appropriate levels on HSSE issues;
- Establishing personal HSSE roles and responsibilities for all workplaces personnel ensuring that they are trained and competent to carry out their activities;
- Consulting with our customers, regulators and other stakeholders to promote continuous improvement in HSSE performance; and
- Working with our Supply Chain and Partners to deliver world class HSSE performance to our customers in their operations.

Date: 1 April 2017

Jonathan Lewis
Chief Executive Officer

BEYOND ZERO

As part of each HASP development, Amec Foster Wheeler conducts a job hazard analysis (JHA) for all routine and non-routine tasks to be conducted during each project. The purpose of developing a JHA is to anticipate and prepare for any potential health and safety related issues. HASPs and JHAs are completed by the competent employees with the assistance from designated Amec Foster Wheeler Health and Safety Coordinators, such as Gabe Sandholm, defined as a key member of the Amec Foster Wheeler Team. Project managers review and approve HASPs for their projects prior to any field activities. All on-site personnel must review the site-specific HASP prior to visiting the site. Tailgate safety meetings must be conducted daily throughout the duration of fieldwork. Safety related forms included in each HASP must be signed off by all employees and subcontractors daily.

Arrange for site access

AmecFoster Wheeler understands that environmental issues do not obey site boundaries, and that obtaining access to on-site and off-site properties are an important component of a successful environmental investigation. Amec Foster Wheeler completes access agreements for public and private land owners, discusses planned activities, and secures signed agreements before work is initiated on a property.

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Representative Experience

Former Gas Station/Java Detour Site (LS17886): was opened as a result of a MnDOT corridor assessment in 2010 which indicated petroleum impacts at the site. Historic records indicate that the site was used as a gas station until 1977. A coffee shop now occupies the site, which is owned by an out-of-state company with a property owner that also lives out of state. Amec Foster Wheeler began LSI activities by contacting the multiple parties involved to explain the necessary investigation activities at the site, directed by the MPCA. The property owner provided very explicit instructions to not disturb operation of the business, which operates from 6:00 am to 9:00 pm, and that drilling could not occur within concrete-paved areas of the site. The owner also required that these restrictions be written into the access agreement along with the specific scope of work, requiring that a new access agreement be written for the site property each year. Given that the site is only 0.3 acres in size along with a high concentration of utilities in the source area, the additional restrictions imposed by the property owner made characterizing the site contamination an increased challenge. Site investigation activities also required access to work in the MnDOT trunk highway north of the site, which therefore required additional permitting and coordination. Separate access agreements were also obtained to conduct work on the properties to the north, west, and northwest of the site.

Coordinate utility locates by contacting the appropriate entity and if applicable coordinate traffic control

Coordinating the location of subsurface utilities is an important component of any subsurface activity. Amec Foster Wheeler coordinates with GOPHER STATE ONE CALL and private utility locaters to conduct utility locates, meets, and design utility locating tasks. Existing on-site utility drawings also are utilized to determine subsurface features, if available. Amec Foster Wheeler makes it a priority to understand the network of buried utilities at a Site, not only for the safety of the onsite personnel, but also to understand how the location and construction of some utilities may affect the fate and transport of the contaminants of concern.

At times, the need arises for work to be completed either within active roadways, or within a roadway right of way, increasing the need for further safety measures. In those situations, Amec Foster Wheeler coordinates traffic control measures, varying from safety cones and appropriate flagging, to flagmen and even coordination with local emergency services to provide the appropriate level of protection. We are experienced with obtaining right-of-entry permits, encroachment permits and construction permits from local units of government.

Prepare and evaluate bid specifications

Amec Foster Wheeler's expertise in preparing specifications and evaluating bids is evident in our vast project matrix. Bids are prepared for a variety of activities, including drilling, construction and treatment system installation and demolition. Amec Foster Wheeler routinely evaluates complex bid packages, weighing safety, technical ability and cost, to select the most appropriate contractor for the project. We utilize the American Institute of Architects (AIA) 51 Division or 17 Division format specifications as appropriate to the job. We have developed company and project specific specification sections that help keep project costs to a minimum. As an MPCA/MDA contract holder, Amec Foster Wheeler staff are familiar with all aspects of the MPCA Purchasing Manual and have developed bid specifications and completed procurement activities in accordance with the purchasing manual for remediation systems and other services not covered by existing Department of Administration contracts.

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Representative Experience

Former Soo Line Railroad Site: Amec Foster Wheeler conducted bidding activities for the demolition of a former petroleum recovery and remediation system at the Former Soo Line Railroad site (LS0000544) in accordance with the MPCA purchasing manual. Tasks involved in the project included an asbestos inspection and sampling as necessary, completion of bid specifications, a site walk with the contractors, and finalizing the bid package documents to assess them for bid selection. Amec Foster Wheeler followed the purchasing manual including completion of the following items, Request for Quotation, Specification for Services, Pricing Bid Sheet, and requests for Responder's Qualification and Example Certification of Liability Insurance forms. Solicitations were submitted to contractors and the contracting was coordinated with the MPCA.

Evaluate invoices

Amec Foster Wheeler has experience managing multiple contractors over a range of complex to relatively simple project tasks. We review every invoice to ensure it matches the appropriate bid submittal before approving payment. Items beyond the approved bid submittal must have change order approval or a signed amendment in place before Amec Foster Wheeler authorizes payment. Similarly, data reports delivered by subcontractors are reviewed for completeness and adherence to agreed scope of service. Amec Foster Wheeler approves only those reports that meet the objectives outlined in the subcontractor agreement. As a MPCA/MDA Level III Professional and Technical Master Services contract holder since 2008, Amec Foster Wheeler staff understand the contract requirements and the importance of paying state contractors in a timely manner. As such, our project managers review state contractor invoices upon receipt and request any changes necessary immediately following review.

Assist and provide training as requested by the MPCA or MDA.

Amec Foster Wheeler staff have significant expertise communicating our knowledge, both general and project specific, to our network of private and public clients. Training efforts have included a field-focused event informing MPCA and MDA of the latest sampling techniques to informal presentations communicating project-specific details.

Representative Experience

- Amec Foster Wheeler was selected by the MPCA to provide TMDL Best Management Practices Training
- Teamed with MPCA VIC staff and MDH staff, to conduct a vapor intrusion seminar for local professionals and property owners.
- Participated in two projects supporting MPCA initiatives in Emerging Contaminants and Soil Reference Values (SRVs). Amec Foster Wheeler was contracted to develop a Perfluorochemical (PFC) Information Clearinghouse that included the compilation of more than 1200 technical references on PFCs. As part of the project, Amec Foster Wheeler developed a User's Guide and trained MPCA staff on the use of the PFC clearinghouse tool. Amec Foster Wheeler was also hired to support the evaluation of SRVs in support of the MPCA SRV Work Group and develop a User's Guide to support the revised SRVs.

Follow MPCA Green practices/procedures for remediation projects

The EPA has established recommendations, requirements, standards, and practices that promote sustainable environmental stewardship. Within these items, the MPCA has identified 5 main categories of "green" practices which can be applied in the Petroleum Remediation Program (PRP). The five categories include:

- Purchasing
- Transportation
- Field Work

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- Project Management
- Waste Reduction

As a current MPCA and MDA Level 3 Environmental Services contractor, Amec Foster Wheeler has been providing Annual Usage reports as well as Green Practices Work Plans for MPCA projects. Amec Foster Wheeler is also familiar with Green and Sustainable Remediation (GSR) guidance (c-prp1-10) and incorporates GSR into our planning and design process.

Oversee hydrogeologic investigations including fate & transport modeling, capture zone analysis and pump tests

Amec Foster Wheeler has vast experience conducting detailed hydrogeologic investigations and data analysis, including groundwater flow and contaminant fate and transport modeling, capture zone analysis, aquifer pumping test design and analysis, slug test design and analysis and specific capacity testing and analysis. We use nearly all the commonly-utilized software for hydrogeologic investigations, including MODFLOW, RT3D, BIOCHLOR, BIOSCREEN, NAS, and AQTESOLV. Amec Foster Wheeler also conducts capture zone analysis for operating groundwater extraction remedies to confirm adherence to remedial action objectives.

Amec Foster Wheeler routinely utilizes our hydrogeologic skill set to design groundwater remedies, including groundwater pump and treat, in-situ bioremediation, in-situ chemical oxidation, and air sparging. We model the migration of contaminants between soil and groundwater, groundwater and soil vapor, and groundwater and surface water, because the interactions between these media typically have a significant impact on remedy selection, design, operation and optimization. Our local Amec Foster Wheeler office also owns the 3D visualization and animation software called Earth Volumetric Studio (EVS) by CTech and we have utilized this package in conjunction with other groundwater modeling software packages to maximize presentation and geostatistical measurement and verification.

Representative Experience

- Groundwater Modeling – Confidential Client – Hennepin County, MN. Amec Foster Wheeler developed a numerical groundwater flow in support of ongoing RI activities consisting of groundwater extraction of a trichloroethylene (TCE) groundwater plume. The groundwater model was developed to assist with extraction system design, as a tool to simulate groundwater flow on and off-Site, and evaluate the hydraulic effect, of groundwater extraction/remediation design. The regional scale Twin Cities Metropolitan Area groundwater flow model v.3.0 (MM3) was used as a basis for the model. A fully integrated pre- and post-processor, Visual MODFLOW, was used to assemble the input data for the model and to present the output results. Simulations were conducted by using MODFLOW-NWT.

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- Groundwater Modeling Support, Pease Air Force Base, New Hampshire: Amec Foster Wheeler developed a groundwater model related to groundwater contamination by polyfluoroalkyl substances (PFAS). Groundwater sampling results showed PFAS detected above the Health Advisory (HA) of 0.07 micrograms per liter (µg/L). A numerical groundwater flow model was deemed appropriate to support addressing the identified data gaps, including visualizing flow patterns at the site, and to aid in decision making with respect to potential future data collection, monitoring, and remedial efforts. The hydraulic flow model was developed using MODFLOW-NWT and covers approximately 32.7 square miles of the Newington peninsula centered on the former base. The flow model was calibrated using manual adjustments of model input parameters in combination with Parameter ESTimation code (PEST). Adjective transport modeling using MODPATH and advection-dispersion modeling using MT3D has been used in conjunction with the MODFLOW-NWT flow model to support selection of sentinel monitoring well locations, selection of a final remedial option, and for the final design of a multi-million-dollar water quality treatment system designed to protect municipal supply wells.

Prepare Engineering Evaluation Costs Analysis (EECA)

Amec Foster Wheeler has performed numerous Engineering Evaluation/Cost Analyses in support of CERCLA remedial actions. An EECA, essentially a more focused feasibility study, allows Amec Foster Wheeler to define the scope and objectives of the removal/remedial objectives, provide justification for the proposed action, identify applicable or relevant and appropriate requirements (ARARs), evaluate remedial technologies and develop and evaluate alternative approaches to the remedial action. Each alternative is evaluated in terms of effectiveness, implementability, cost and compliance with the identified ARARs. For each alternative identified, Amec Foster Wheeler evaluates both initial capital cost, and other costs that may be incurred during the entire remedial action (operating and maintenance [O&M], system shut-down, abandonment etc.). The entire life-cycle cost is considered to evaluate cost effectiveness of each alternative. Following the evaluation, a recommendation is made for the removal/remedial action and a schedule for implementation of the preferred alternative developed.

Representative Experience

Amec Foster Wheeler recently developed EECAs for two sites defined as Areas 1 and 2 to address PCBs in sediment and floodplain soil. In the Area 1, the use of the "stream-tube" method for SWAC calculation and a geomorphic screening exercise which predicted areas of probabilistic contamination helped to reduce the area for remedial alternative development from 22 to 1.6 river miles. The process also facilitated selection of a favorable remedy (projected savings of $20M) as indicated in EPA's Record of Decision which outlines limited but protective removal of sediment and floodplain soil as its selected remedial alternatives for Area 1. Area 2 included innovative alternatives which feature dynamically stable stream channel design elements to avoid site-wide removal and habitat destruction. Hydrodynamic and sediment transport models are being developed to support FS development for downstream Areas and will include the evaluation of conditions with the dams remaining in place or being removed. As the site and surface water have been determined to be safe for recreation, the primary objective of remedy development and selection is the reduction of PCB concentrations in fish tissue with the ultimate goal of achieving fish that are safe to eat, thereby reducing or eliminating the need for fish consumption advisories. Fish contaminant concentrations will continue to be the measure of progress for the site.

Oversee or conduct bench scale lab treatability studies, pilot testing and field demos

Amec Foster Wheeler has extensive experience in the oversight and implementation of pilot tests for remedial systems. Pilot tests are conducted to evaluate effectiveness of remedial technologies to a particular site and/or contaminant, obtaining site-specific data for detailed system design, and confirming that bench-scale testing results will translate to full-scale implementation. The type and duration of a pilot test varies based on

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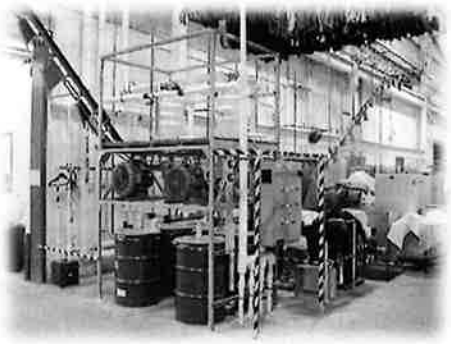
the type(s) of remedial technologies being studied. For example, an AS/SVE pilot test would be conducted at varying pressures (AS) and vacuums (SVE) to determine the optimal radius of influence for the wells. Air samples would be collected to determine the concentrations of contaminants at the varying test points. Results of the pilot study would then be used to specify system energy requirements, define the location, spacing and depth of AS/SVE wells and identify the concentrations of contaminants captured for selecting and sizing system components (e.g. carbon) for treating captured vapor.

Amec Foster Wheeler staff has conducted pilot tests for hundreds of remedial systems across USEPA Region 5 including Minnesota.

Representative Experience



- Release of dry-cleaning solvents from a facility in Hibbing, Minnesota resulted in contaminated soil under the building. The solvents accumulated under a wall between an older part of the building and a newer addition. Soil boring data indicated the soil permeability on the older side of the wall was lower than for the soil on the newer side of the wall. Amec Foster Wheeler conducted soil vapor extraction pilot tests for each side of the wall. For each test, one soil vapor extraction well and four observation wells installed. Each test included a step test at four different flow rates followed by a steady rate test. The results of the tests were used to design separate SVE systems for each side of the wall.
- Amec Foster Wheeler performed a pilot test for installation of an SVE system at the site of a former dry-cleaning solvents release in Hennepin County, Minnesota. Following initial soil and groundwater investigation, it was determined that a SVE system be installed to address PCE contamination. The SVE pilot test consisted of the installation of one SVE well and ten temporary monitoring points. The test was conducted at various step flow rates to evaluate the radius of influence. The pilot test results were subsequently used in the design of the full-size system. Following completion of the pilot test, the SVE system was designed and a full-size system has been installed and is successfully operating as designed.
- Amec Foster Wheeler conducted bench and pilot scale testing of regenerable ion-exchange resin in a side-by-side comparison with granular activated carbon in response to PFAS drinking water contamination. Amec Foster Wheeler was able to regenerate the resin to 100% capacity and illustrate successful removal of the more recalcitrant shorter-chain PFAS compounds. The ion-exchange media was regenerated using a regenerate solution which was illustrated to be more cost-effective than GAC. A full-scale ion-exchange resin system was designed and constructed at the site.

Oversee equipment start-up and work out problems with the Contractor/Vendor

Amec Foster Wheeler staff has experience designing, conducting construction oversight for installation and completing operations and maintenance activities for remedial systems. Part of the process also includes development of operation and maintenance manuals for long-term operation of such systems. Once remediation systems become operational, it is our goal to maintain equipment function and find opportunities to maximize system effectiveness and minimize operational costs. To that goal, we maintain accurate system records, perform routine maintenance, and continually review operational costs. Another important aspect to system operation is conducting initial troubleshooting at system start-up and providing oversight and support for long-term O&M contractors. Amec Foster Wheeler has the ability to quickly determine system components that require rehabilitation, repair or replacement, and getting the correct parts and/or contractors on-site to get the system back to operational status.

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Prepare and determine if the Stormwater Pollution Prevention Plan (SWPPP) is being followed and make recommendations if revisions are needed during the life of the construction project

Amec Foster Wheeler engineers prepare stormwater plans to address stormwater quantity and quality issues at each site. Amec Foster Wheeler reviews each site to learn about areas where stormwater management has been a problem in the past. For example, we identify areas that flood frequently during rain events. Next, we review changes to the site, such as changes to impermeable surfaces that might impact stormwater runoff. When working on contaminated sites, it is always critical to look at the potential for sediment or other contaminants to be moved within the site or away from the site. Amec Foster Wheeler uses HydroCAD to evaluate most sites, although more complex models are available if necessary. We are very sensitive to protecting sensitive natural resources such as impaired waters, trout streams, calcareous fens, and other areas with outstanding resource value. We have experience with stormwater infiltration for maintaining stormwater volume control as well as rate control. Stormwater plans for the periods during construction and after construction are reviewed with cities, watershed districts, MPCA, and other interested parties before being implemented and are amended as changes arise.

Representative Experience

Amec Foster Wheeler prepared a SWPPP in support of a fueling system construction project in Washington County, Minnesota. The SWPPP was developed using the MPCA stormwater manual and associated templates, and Amec Foster Wheeler completed several revisions in collaboration with the client prior to and during the 16-month construction project. Updates to the SWPPP included, updates to terminology and contact information, updates to site layouts as various stages of construction were completed, updates to BMPs associated with performance observations, updates to scope of work and updates to BMPs to address testing activities in the final construction phase.

Install stainless steel soil gas sampling ports using an electric drill to bore through floor slabs

Amec Foster Wheeler staff has experience installing stainless steel soil gas sampling ports in both residential and commercial settings. Amec Foster Wheeler employs a procedure where a stainless steel Vapor Pin® is installed through a concrete floor slab, upon boring through the floor with an electric rotary-hammer drill. The sample ports are installed with a Teflon® sleeve and pin cap providing vapor seals at the pin and surface in a manner as to be air-tight and allow for an accurate assessment of the sub-slab vapor conditions, pursuant to MPCA best management practices for vapor investigations in guidance document c-rem3-06e.

Once a determination is made to conduct a vapor investigation, specifically including the need for sub-slab soil vapor samples, Amec Foster Wheeler initiates the process by conducting a utility clearance event to allow for the safe installation of an appropriate amount of Vapor Pin® sample ports, dictated by MPCA guidance document c-rem3-06h. Once installation locations are cleared, personnel proceed to install the sample ports following routine installation procedures set forth by Vapor Pin. During the installation process, care is taken to ensure the least impact to the surrounding area, by utilizing a wet/dry vacuum to capture and contain the concrete particulates.

The need for sub-slab sampling most often occurs at inhabited residential or commercial properties where daily activities cannot be hindered, thus Amec Foster Wheeler aims to create the least impact to the building use both during installation and over the course of time in which the sample ports remain in place. To that goal, we strive to coordinate with property owners to choose installation windows which will have the least impact on the building occupants as well as offer the ability to install recessed sample ports, so that traffic is

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not impeded, even when the sample ports remain for some time. Amec Foster Wheeler has been amenable to installation of sub-slab sample ports in commercial buildings during non-working hours, and offer flush covers to protect sample ports that are needed in high traffic areas.

Upon completion of sub-slab sampling activities, Amec Foster Wheeler has the ability to restore the flooring conditions to their original condition by removing the Vapor Pin® sample ports and patching the sample location. These procedures describing the installation, use, and removal of the stainless steel soil gas sampling ports can be accomplished in a single day, or over the span of multiple seasonal events.

Representative Experience

- Former Stoltz Dry-Cleaners, St. Paul, MN: Amec Foster Wheeler conducted an off-site soil vapor assessment for the former Stoltz Cleaners property. The soil vapor assessment consisted of collecting soil-gas and sub-slab vapor samples from properties within the vicinity of the former Stoltz Cleaners property to further evaluate the extent of potential soil vapor migration from the Site. During completion of the building survey for the building where the sub-slab sample ports were to be installed, it was determined that only a partial basement existed. Consequently, three sub-slab vapor sampling ports were installed from beneath the main floor (slab on grade) and one sub-slab vapor sampling port was installed in the basement.
- Former Morning Star Church Property, St. Paul, MN: On behalf of the MPCA, Amec Foster Wheeler conducted a Soil Vapor Investigation at the Morning Star Church Site, including the installation of sub-slab vapor sample points in several different types of buildings surrounding a former drycleaner operation. Building types ranged from single-family residential to multi-use commercial/residential. Amec Foster Wheeler personnel conducted initial building surveys to assess installation locations and building conditions pursuant to determining 33x Intrusion Screening Values (ISVs) applicability. Amec Foster Wheeler personnel followed MPCA guidance to install and sample the sub-slab sample points. In each of the properties tested, exceedances to applicable ISV criteria indicated the need for expedited mitigation activities.

Collect and manage field and laboratory data for electronic submittal in a format specified by the MPCA

Amec Foster Wheeler is well versed in the collection and management of field and laboratory data for electronic submittal. Amec Foster Wheeler utilizes a variety of electronic data collection technologies and uses field tablets equipped with electronic forms. Forms can then be exported in a variety of formats including ascii text files for inclusion into project specific databases. Amec Foster Wheeler also works with laboratories to provide electronic data deliverables in a wide variety of formats including Earthsoft's EQuIS™, and ERPIMs formats. Amec Foster Wheeler personnel manage project data electronically and routinely utilize Earthsoft EQuIS.

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Exhibit 6. Project Personnel Compared to Scope of Work

	Management											Subject Matter Experts							
	G. Bondy	G. Sandholm	E. Driver	A. Bernhardt	A. Fiskness	J. Murer	E. Siewert	S. Thomas	C. Vowles	C. Hudak	J. Grams	C. Abate	H. Albertus-Benham	C. Landrum	B. Marxen	J. Renier	R. Talbot	M. Vavra	D. Woodward
Oversee site investigation services for soil boring advancement, and monitoring well installation using both standard drilling methods, and direct push methods.			•		•	•			•	•			•		•	•		•	•
Conduct ground water, soil, surface water, sediment, and air sampling and monitoring.			•		•	•			•	•			•		•	•		•	
Conduct vapor/air monitoring for health and safety and air quality criteria.			•		•	•			•				•		•	•	•	•	
Conduct and/or oversee site assessment activities (Phase I and Phase II), limited site investigations and remedial investigations.			•		•	•			•	•			•		•	•		•	•
Conduct surface water, ground water, air and vapor receptor surveys.	•		•		•	•			•				•		•	•		•	
Oversee construction to mitigate vapors and conduct non-construction mitigation measures such as using fans, etc.					•	•			•				•		•	•			
Conduct or oversee operation and maintenance on remedial systems.	•				•				•				•		•	•	•	•	•
Arrange for transportation, storage, and proper management of wastes.	•		•	•	•	•	•		•	•			•		•	•		•	
Evaluate the need for and oversee the implementation of alternative drinking water supply, including point-of-use treatment (i.e. filtration).	•		•	•		•						•			•				•
Coordinate and cooperate with other State-contracted services such as sampling and analytical, emergency response contractors, and hazardous waste services.	•		•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
Arrange for geophysical activities	•		•		•	•	•	•	•	•	•		•	•	•	•	•	•	•
Oversee subcontractors and state contractors during investigation and cleanups and tank removals	•		•		•	•			•				•		•	•		•	•
Prepare and evaluate reports (e.g., investigation reports, monitoring reports, free product recovery reports).	•		•		•	•		•	•	•	•		•	•	•	•		•	•
Prepare Health and Safety Plans (HASP).	•	•	•	•	•	•		•	•	•	•		•		•	•		•	•
Arrange for site access.	•		•		•	•		•	•	•	•		•	•	•	•		•	
Coordinate utility locates by contacting the appropriate entity and if applicable coordinate traffic control.	•		•		•	•	•	•	•	•			•		•	•		•	
Prepare and evaluate bid specifications.	•		•	•					•		•		•		•		•		•
Evaluate invoices.	•		•	•	•	•		•	•	•	•		•		•	•		•	
Assist and provide training as requested by the MPCA or MDA. Training must be related to the scope of this contract.	•	•	•	•	•	•		•	•	•	•		•	•	•	•		•	•
Follow MPCA Green practices/procedures for remediation projects.			•		•	•		•	•	•	•		•	•	•	•	•	•	•
Oversee hydrogeologic investigations including fate & transport modeling, capture zone analysis and pump tests.	•				•	•			•	•		•		•	•	•	•	•	•
Prepare Engineering Evaluation Costs Analysis (EECA).	•			•											•	•	•		•
Oversee or conduct bench scale lab treatability studies, pilot testing and field demos.	•		•		•										•	•	•		•
Oversee equipment start-up and work out problems with the Contractor/Vendor.	•		•		•				•		•		•		•	•	•	•	•
Prepare and determine if the SWPPP is being followed and make recommendations if revisions are needed during the life of the construction project.			•										•		•			•	
Install stainless steel soil gas sampling ports using an electric drill to bore through floor slabs.					•	•			•				•		•	•		•	
Collect and manage field and laboratory data for electronic submittal in a format specified by the MPCA			•	•	•	•		•	•	•			•	•	•	•	•	•	

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Exhibit 6. Project Personnel Compared to Scope of Work (Continued)

	Engineers														Scientists / Technicians																		Other
	Z. Al-Yassiri	S. Bashir	A. Gagne	S. Hansen	G. Hauck	K. Krol	J. Moran	D. O'Connell	D. Ott	E. Palomino	J. Paul	C. Starkell	T. Rasmussen	T. Shannon	J. Abid	B. Barnes	C. Buckman	D. Costamagna	R. Crawford	S. Cronin	P. Goudreault	S. Henson	E. Heytens	G. Horstmeier	A. Klaustermeier	R. Lahti	M. Matteson	D. Miller	J. Wegleitner	C. Smith	M. Torres	E. Thomas
Oversee site investigation services for soil boring advancement, and monitoring well installation using both standard drilling methods, and direct push methods.	•	•	•						•				•		•	•	•	•	•	•		•			•		•			•	•	
Conduct ground water, soil, surface water, sediment, and air sampling and monitoring.		•	•												•	•	•	•	•	•		•		•	•		•		•	•	•	•
Conduct vapor/air monitoring for health and safety and air quality criteria.		•	•													•			•			•			•		•			•	•	
Conduct and/or oversee site assessment activities (Phase I and Phase II), limited site investigations and remedial investigations.	•	•	•						•				•		•	•	•	•	•	•		•			•	•	•		•	•	•	
Conduct surface water, ground water, air and vapor receptor surveys.		•	•												•	•	•		•	•		•		•	•		•			•	•	•
Oversee construction to mitigate vapors and conduct non-construction mitigation measures such as using fans, etc.		•	•						•							•						•			•		•			•	•	
Conduct or oversee operation and maintenance on remedial systems.	•	•	•						•				•		•	•	•		•			•			•		•			•	•	
Arrange for transportation, storage, and proper management of wastes.		•	•						•				•		•	•	•	•	•	•		•			•		•			•	•	
Evaluate the need for and oversee the implementation of alternative drinking water supply, including point-of-use treatment (i.e. filtration).		•	•						•				•				•															
Coordinate and cooperate with other State-contracted services such as sampling and analytical, emergency response contractors, and hazardous waste services.		•	•						•				•		•	•	•	•	•	•		•	•		•	•	•			•	•	
Arrange for geophysical activities		•	•												•		•			•		•	•			•	•		•		•	
Oversee subcontractors and state contractors during investigation and cleanups and tank removals		•	•												•	•	•	•	•	•		•			•	•	•			•	•	
Prepare and evaluate reports (e.g., investigation reports, monitoring reports, free product recovery reports).		•	•												•	•	•	•	•	•		•			•	•	•			•	•	•
Prepare Health and Safety Plans (HASP).		•	•						•				•		•		•	•		•						•	•		•		•	
Arrange for site access.	•	•	•						•				•		•		•	•	•	•		•				•	•				•	
Coordinate utility locates by contacting the appropriate entity and if applicable coordinate traffic control.	•	•	•												•	•	•	•	•	•		•			•	•	•			•	•	
Prepare and evaluate bid specifications.		•	•	•	•	•	•	•	•	•	•	•	•	•			•			•	•		•				•					
Evaluate invoices.		•	•						•				•		•		•			•						•	•					
Assist and provide training as requested by the MPCA or MDA. Training must be related to the scope of this contract.	•	•	•						•				•				•			•	•	•					•	•				•
Follow MPCA Green practices/procedures for remediation projects.									•				•			•	•	•		•	•	•	•		•					•	•	
Oversee hydrogeologic investigations including fate & transport modeling, capture zone analysis and pump tests.		•	•						•				•		•		•		•								•				•	
Prepare Engineering Evaluation Costs Analysis (EECA).		•	•	•	•	•	•	•	•	•	•	•	•	•													•		•			•
Oversee or conduct bench scale lab treatability studies, pilot testing and field demos.		•	•						•				•				•							•			•				•	
Oversee equipment start-up and work out problems with the Contractor/Vendor.		•	•	•	•	•		•	•			•	•	•	•	•	•						•		•		•			•	•	
Prepare and determine if the Stormwater Pollution Prevention Plan (SWPPP) is being followed and make recommendations if revisions are needed during the life of the construction project.	•			•		•		•	•				•							•		•					•					
Install stainless steel soil gas sampling ports using an electric drill to bore through floor slabs.									•							•			•			•			•						•	•	
Collect and manage field and laboratory data for electronic submittal in a format specified by the MPCA																•	•	•		•		•			•	•		•	•	•	•	•	•

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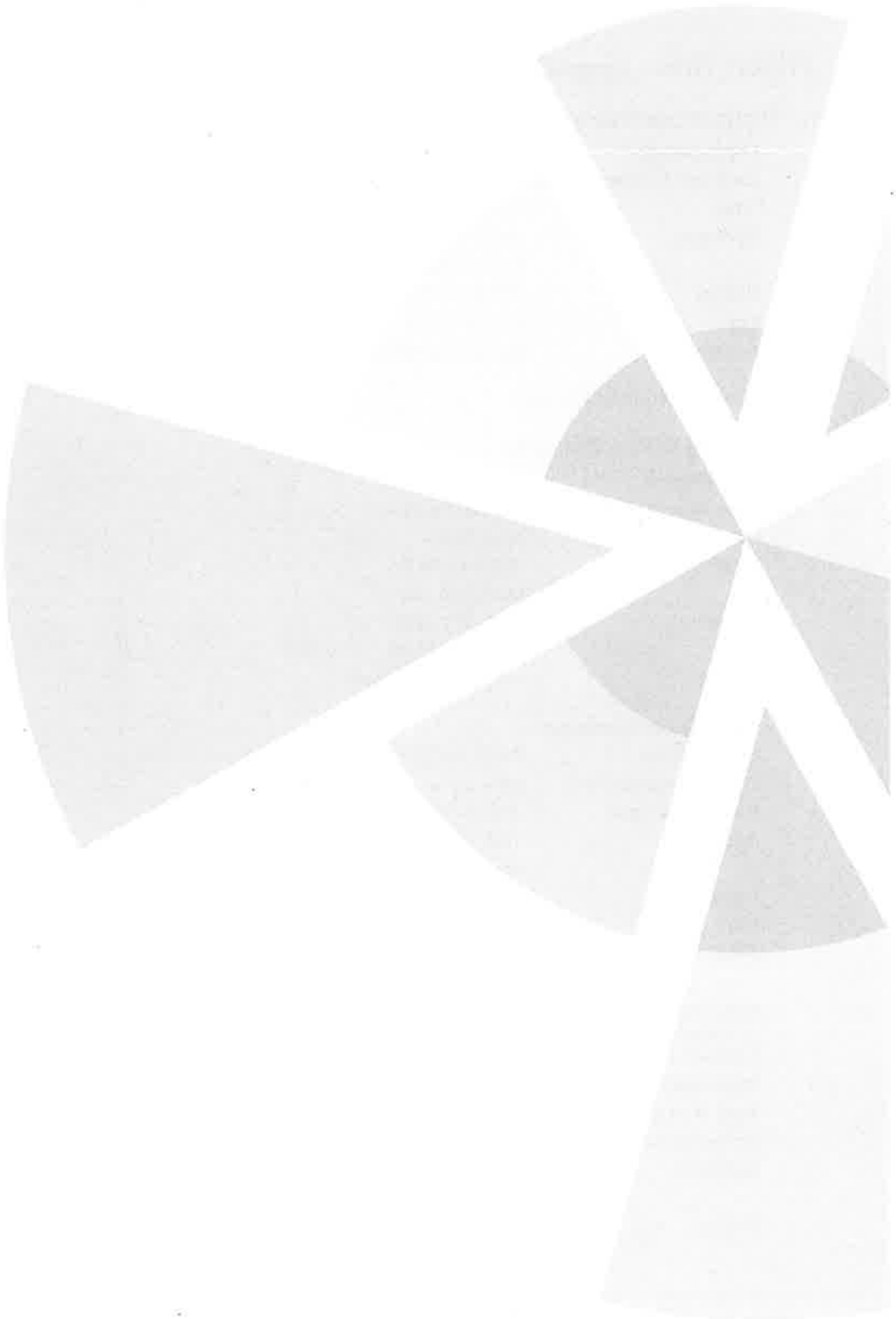
B.5 Scenario B



MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Scenario B: Petroleum Only Environmental Services Workplan

Project Title: **Scenario B: Petroleum Only Environmental Services Workplan**

1. Project Summary:

Organization:	Amec Foster Wheeler Environment and Infrastructure, Inc.
Contractor contact name:	Cory Vowles
Title:	Project Manager
Address:	800 Marquette Ave Minneapolis, MN
Phone:	612-252-3789
Fax:	612-332-2423
E-mail:	cory.vowles@woodplc.com

Subcontractor(s)/Partner(s):

Example Drilling Contractor

Organization:	Thein Well
Type of organization:	Drilling Company
Project manager:	Mike Thein
Address:	102 Dundas Rd, Monticello, MN
Phone:	(763) 271-4200
Fax:	(320) 847-3459
E-mail:	mike@theinwell.com

Example Lab Contractor

Organization:	PACE Analytical
Type of organization:	Laboratory
Project manager:	Jeff Smith
Address:	1700 Elm St.SE Minneapolis, MN
Phone:	(612) 607-6400
Fax:	(612) 607-6444
E-mail:	jasmith@pacelabs.com

Example Remediation System Installation Contractor

Organization:	Stevens Drilling and Environmental
Type of organization:	Drilling, Excavating, Remediation System Installation
Project manager:	Richard Stevens
Address:	6240 Highway 12 W Maple Plain, MN 55359
Phone:	763-479-1797

Fax:	763-479-1872
E-mail:	main@stevensde.com
MPCA contact(s):	**Sarah Larsen**
MPCA project manager:	Artie Dworak
Title:	Project Manager
Address:	520 Lafayette St. Paul, MN 55155-4194
Phone:	(651) 757-2870
Fax:	(651) 296-9707
E-mail:	artie.dworak@state.mn.us

2. Statement of Problems, Opportunities, and Existing Conditions

This Work Plan has been prepared for the Minnesota Pollution Control Agency (MPCA) in response to the Request for Proposal (RFP) for Remediation Master Contract dated February 28, 2018. The work plan proposal also incorporates Addendum 1 to the RFP dated March 19, 2018. This Work Plan addresses 'Scenario B' as described in Section 7 Proposal Content, Category B: Petroleum Only Remediation Environmental Services, Part 5, subparts a and b.

Although not explicitly stated in the scenario, this work plan is based on the property owner having already notified the State Duty Officer of the recent release. The Duty Officer referred the site to Petroleum Remediation Program and an underground storage tank (UST) inspection was conducted which revealed that the current fuel release is limited to the active pump/dispenser islands and associated piping connections at the dispensers. Following inspection, the fueling system has been temporarily shut down. The PRP project lead has requested this work plan to identify risks and characterize the nature and extent of contamination at the site.

SITE DESCRIPTION

This site is an active gas station with an attached 24-hour restaurant. The fueling station is in the approximate center of the site with the attached restaurant constructed on the east side of the fueling station. Four active pump/dispenser islands are located approximately 20 feet south of the fueling station building and the current UST basin (consisting of two gasoline USTs and one diesel UST) is located approximately 30 feet west of the building. A former UST basin (consisting of two USTs with unknown contents) is present beneath the center of the restaurant. A lake is present approximately 240 feet east of the building and separated from the site by a scenic drive/service road. Six privately-owned residences are located north (2) and east (4) of the site. The residences are located on the lake shore and have private wells installed to a depth of approximately 80 feet below ground surface (bgs). The site layout is depicted on Figure 1.

Subsurface structures include on-site utilities (municipal water, storm sewer, and sanitary sewer) which connect the on-site building to the Main Street right-of-way. An active aboveground storage tank (AST) for fuel oil is located on the north side of the fueling station and has been in use since the service station opened in the 1950s.

SITE GEOLOGY AND HYDROGEOLOGY

Well logs for the private wells in the site vicinity, identify interbedded sands and gravels to depths between 40 and 45 feet bgs which overlay shallow bedrock at a depth of 45 feet bgs. Based on this information, a sensitive groundwater condition exists at the Site. Groundwater flow appears to be influenced by the lake and is therefore expected to be towards the east.

SITE HISTORY

The site is located in western Minnesota and has operated as a fueling station since the 1950s. Prior to the construction of the restaurant in the late 1990s, two former USTs that were situated in the footprint of the restaurant were removed. During UST removal, petroleum contamination was evident with strong petroleum odors and elevated photoionization detector (PID) readings up to 1,263 parts per million (ppm) were recorded. No reports of the condition of the USTs were made at the time of removal. More recently, it has been reported that significant staining exists near the four pump/dispenser islands (Source A) and the station has noted a loss of product over the last few months. Presently, the station owner reports that some of the residents have been complaining about petroleum odors in their drinking water.

There is a second (historical) source where the former USTs were once located (Source B), which would also require site investigation activities. While both the recent release at Source A and Source B would be investigated in similar fashions, a measure should be taken early on to determine if the current Responsible Party (RP) for the recent release is the same RP which would be responsible for the historic source, or if the property has changed hands since the former USTs were in use. Amec Foster Wheeler understands that the USTs to the west of the fueling station would have been installed in the 1990s when the historic tank basin (Source B) was abandoned. Therefore, samples collected for the assessment of Source B would be subject to a more rigorous analytical suite than would those samples for Source A, as the contents of the USTs at Source B are unknown, and the contents of the UST systems for Source A are known.

Even though no assessment activities have been conducted at the Site, indications of a recent release, reports of contaminated soil at the Site during UST removal, the possibility of impact to neighboring private supply wells, and the possibility of vapor intrusion to nearby buildings, a petroleum investigation (pursuant to MPCA Guidance Document 1-01 *Petroleum Remediation Program general policy* [PRP1-01]) is warranted to evaluate risk posed by current Site conditions and the potential remediation.

3.Goals, Objectives, Tasks, and Subtasks

Goal: The ultimate goal at this site is to protect human health and the environment from potential risks posed by two separate petroleum release incidents at the gas station/restaurant site. The objectives of this work plan are developed in accordance with the Petroleum Remediation Program (PRP) primary objectives of ensuring safe drinking water supplies, preventing unsafe exposure to petroleum vapors, preventing surface water impacts, and preventing human exposure to contaminated surface soil. Amec Foster Wheeler has defined objectives in accordance with the PRP risk-based approach. Based on our understanding of the site background, history, geology and hydrogeology (sensitive groundwater condition), and current conditions, the following objectives have been identified:

i. Immediate Action to address the recent release from the active fueling system
ii. Site Investigation to evaluate risks, determine the nature and extent of contamination and develop a conceptual site model to provide sufficient information to justify a site management decision.

The immediate action will be completed to evaluate and remediate the recent release of petroleum. A recent release is defined as a release that has occurred within the past 90 days, which in this case is apparent due to the significant staining near the active pump islands and loss of product over the last few months. A recent release requires immediate action to stop contamination from spreading. Fast and effective response minimizes environmental and human impact and overall cost for investigation and cleanup.

The immediate action will consist of conducting sampling of private water supply wells to determine whether the recent petroleum release has impacted the quality of drinking water. The immediate action will also involve excavation of petroleum impacted soils at the active pump dispensers to the extent possible. Excavation is required to reduce the ongoing source for dissolved contaminants which are likely reaching the water table and migrating towards the lake.

Amec Foster Wheeler believes that a swift and thorough excavation at the dispenser islands (Source A) may achieve successful cleanup of the recent release, to the satisfaction of program-driven PID extents in soil; however, due to the proximity of the lake, it is likely that groundwater would be encountered during the excavation activities. Therefore, following implementation of the response and cleanup of the recent release at the pump islands, site investigation activities in the form of a Limited Site Investigation (LSI) will be conducted to assess the extent and magnitude of the petroleum releases (recent and historic) to develop a site management strategy.

The following is a summary of the objectives and tasks required to meet the objectives.

OBJECTIVE 1: IMMEDIATE ACTION (EMERGENCY CONDITIONS AND RECENT RELEASE)

TASK A: PRIVATE WELL SAMPLING

Based on reports of petroleum odors in the nearby private supply wells, immediate action should be taken to assess whether drinking water standards are being exceeded. As a sensitive groundwater condition exists at the site, all six supply wells identified within 500 feet of the source will be sampled. Amec Foster Wheeler proposes to initiate this sampling immediately, to best protect human health. Results from the sampling will be used to determine whether an interim corrective action (ICA) such as connecting residences to municipal water supply or providing point-of-entry water treatment system is required at any of the residences. If results of well sampling indicated that ICA is necessary, Amec Foster Wheeler would coordinate with both the PRP and the Emergency Management Unit (EMU) throughout the process.

Subtask 1: Amec Foster Wheeler will coordinate the immediate response with PRP project lead, including obtaining site access for each property with a private well located within 500 feet.

Subtask 2: Based on the current site information and planned subsurface activities, Amec Foster Wheeler will prepare a Site-specific health and safety plan (HASP) addressing safety of the field staff and the public for field activities pertinent to the Interim Corrective Actions and subsequent LSI activities.

Subtask 3: Amec Foster Wheeler will then sample each of the six private supply wells following the procedures and analytical requirements described in *Groundwater Sample Collection and Analysis Procedures* (PRP4-05).

Amec Foster Wheeler will identify potential sampling points located prior to water treatment or other appurtenances and select the one closest to the well. We will then calculate and purge the appropriate volume of water from the well and any appurtenances, to ensure a fresh, representative sample. At that point the flow rate will be reduced to the minimum required to maintain a continuous flow and samples will be collected.

The samples will be submitted to the analytical laboratory with an expedited turnaround time.

As the source of the possible impacts to the private supply wells is unknown, and site history suggests that the contents of the former USTs is unknown, Amec Foster Wheeler recommends that the private supply wells be analyzed for the full suite of analyses applicable to an unknown source. Therefore, the private supply well samples will be analyzed for:

- VOCs using EPA Method 8260;
- GRO using Wisconsin (WI) Department of Natural Resources (DNR) Modified GRO Method;
- DRO using WI DNR Modified GRO Method;
- Resource Conservation and Recovery Act (RCRA) Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver (only applicable to soil samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown);
- Polychlorinated Biphenyls (PCBs) using the most recent version of EPA Method 8082 by the Aroclors method;
- Low-level analysis for 1,2-dibromoethane (EDB) and 1,2-dibromo-3-chloropropane (DBCP) by EPA Method 8011 if instructed to include by the MPCA project manager; and
- PAHs by EPA Method 8270 if instructed to include by the MPCA project manager.

Subtask 4: Following receipt of analytical results, Amec Foster Wheeler will assess the need for ICA (i.e., providing an alternate water supply or installing a treatment system) by comparing the results to drinking water standards. Findings will be communicated to the PRP and EMU as applicable. Recommendations would also be made for drinking water advisory notifications where required. An analytical summary table will be prepared and submitted to the MPCA to facilitate communication of sampling results to individual homeowners.

Responsible Party(ies): Project Manager, GIS/CADD Specialist, Scientist 1, Field Technician

Task B: SOIL EXCAVATION

Soil excavation at the dispenser islands due to a recent release (prior to conducting LSI). A recent release requires immediate response and recovery to stop contamination from spreading, regardless of risk to receptors. Fast and effective response minimizes environmental and human impact and overall cost for investigation and cleanup. Upon implementation of the interim excavation, a General Excavation report, or similar report will be submitted to the MPCA for review and approval.

Subtask 1: Amec Foster Wheeler will coordinate the immediate response with the PRP project lead and current property owner. During this stage, Amec Foster Wheeler will also procure a state contractor to conduct excavation activities. Other preparation activities include coordinating utility clearance, using Gopher State One Call and a private utility locator.

Subtask 2: Amec Foster Wheeler will conduct excavation of contaminated soils. Excavation activities will begin with the completion of utility clearance. Soil excavation activities will be conducted in accordance with MPCA PRP Guidance Document 3-01. Amec Foster Wheeler assumes that excavation will occur at the same time as system repair activities (to be conducted by others outside the jurisdiction of the PRP).

The excavation will be guided by soil headspace screening as collected by a PID as well as by the petroleum sheen test. As the active tanks include both gasoline and diesel, a target of 10 parts per million by volume (ppmv) will be used to determine the extent of the excavation. As the excavation proceeds, Amec Foster Wheeler will collect and field screen soil samples frequently enough to verify the need for soil removal (at least one sample for each 10 cubic yards of soil removed). Amec Foster Wheeler will excavate up to 200 cubic yards of material.

After the excavation is complete but before returning any soil to the excavation basin, Amec Foster Wheeler will collect soil samples for laboratory analysis to document the contamination remaining in place (if any). One sidewall sample will be collected for every 25 lineal feet of sidewall (with a minimum of four), as will one bottom floor sample per every 100 square feet. If groundwater is encountered in the excavation, then one groundwater sample will also be collected.

As potential other impacts are already suspected (i.e., petroleum impacts to private water supply wells), a LSI is required and therefore a post-excavation boring will not be completed during the immediate response and is instead recommended during the LSI.

Soil sample analysis for the excavation activities will be performed according to MPCA PRP4-04, and will consist of the following:

- An estimated 5 samples (four side-wall and one bottom floor) will be collected for laboratory analysis of:

- 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, naphthalene, methyl-tertiary-butyl-ether (MTBE) benzene, toluene, ethylbenzene, m&p-xylene, and o-xylene, using EPA Method 8260 for PVOCs; The full VOC suite will not be requested for the soil samples since groundwater samples will be analyzed for VOCs.
- GRO using Wisconsin (WI) Department of Natural Resources (DNR) Modified GRO Method;
- DRO using WI DNR Modified GRO Method; and
- PAHs by EPA Method 8270 if instructed to include by the MPCA project manager.

Depth to water is anticipated to be approximately 8 feet bgs. If groundwater is encountered during the excavation activities, one groundwater grab sample will be collected for:

- VOCs using EPA Method 8260;
- GRO using Wisconsin (WI) Department of Natural Resources (DNR) Modified GRO Method;
- DRO using WI DNR Modified GRO Method;
- PAHs by EPA Method 8270 if instructed to include by the MPCA project manager.

Subtask 3: Amec Foster Wheeler will manage the contaminated soil, by stockpiling it on minimum 40-mil plastic. The stockpile will be covered at the end of each day with minimum 6-mil reinforced plastic or 10-mil unreinforced plastic and securely anchored. Amec Foster Wheeler will collect and analyze soil samples from representative portions of the stockpile following the procedures and analytical requirements described in *Soil Sample Collection and Analysis Procedures* (PRP4-04). Following waste characterization, Amec Foster Wheeler will coordinate waste transport and disposal.

Subtask 4: Excavation activities and sampling results will be documented in a General Excavation report.

Responsible Party(ies): Project Manager, Scientist 1, Scientist 2, GIS/CADD Specialist

Objective 1 Timeline: Less than 2 months

Objective 1 Deliverables:

- Analytical Summary
- Petroleum Release Notification Follow-up (Guidance Document 2-08)
- Corrective Action Excavation Report Worksheet (Guidance Document c-prp3-02a), as applicable
- General Excavation Report with appropriate appendices (Guidance Document 3-02)

OBJECTIVE 2: CONDUCT A LIMITED SITE INVESTIGATION

TASK A: PERFORM DOCUMENT SEARCH AND DOCUMENT REVIEW
Amec Foster Wheeler will perform a record search with local government offices in the event that information relating to the fueling station operation or tank removals is available.

Responsible Party(ies): Project Manager, Scientist 1, GIS/CADD Specialist

TASK B: RISK EVALUATION: RECEPTOR SURVEY
A receptor survey will be conducted to identify potential receptors of petroleum contamination at the site and evaluate risks posed to each type of receptor. The receptor survey will include a risk evaluation for water supply well receptors (private and public water supplies), water line permeation receptors, surface water receptors, vapor receptors, and surface soil receptors. This survey will take place during the same mobilization as the immediate actions for the excavation and private well sampling event.

Subtask 1: Water supply receptor survey - This includes a walking survey within 500 feet of the Site. During completion, Amec Foster Wheeler will:

1. identify and contact residents and business owners, and complete a visual inspection of the properties;
2. confirm public water supply at any of the included properties by contacting the city utility billing department;
3. review the Minnesota Well Index for wells within 1/2 mile of the sources. As details were given to suggest that private water supply wells are being impacted, immediate sampling of the private supply wells should commence in an effort to protect human health (as detailed in Objective 1, Task A);
4. Amec Foster Wheeler will assess sensitive groundwater conditions by first accessing the PRP Maps online, and if necessary, determine the aquifer's susceptibility to contamination. As the depth to bedrock at the Site is less than 50 ft bgs, a sensitive groundwater condition exists. Risk evaluation activities will

also include determination of flow direction and calculation of hydraulic gradient in the case that monitoring wells are installed as part of remedial investigation activities.

Information accrued during the water supply receptor survey and risk evaluation stage will be input into the Site Investigation Report (c-prp4-06).

Subtask 2: Water line permeation receptor survey– Since water supply lines from the city utility beneath Main Street south of the site, connect to the site buildings, it is likely that one or both traverse a contaminated area. Amec Foster Wheeler will coordinate with the local municipality/public works department or utility company to obtain details regarding the construction of the water lines.

Subtask 3: Surface Water receptor survey will be conducted to identify and map locations of all surface water bodies within ¼ mile of the Site. Amec Foster Wheeler will also identify any potential pathways such as drainage ditches, drain tiles, storm sewers etc., that may lead from the site to an identified water feature (including the lake east of the site).

Subtask 4: Vapor receptor survey: A soil vapor receptor survey will be conducted to evaluate the presence of potential soil vapor receptors. The receptor survey will consist of:

1. contacting local utility companies to confirm subsurface structures;
2. identifying access points (man-ways, etc.) and possible other receptors (e.g. buildings with basements) based on a record search and visual inspection from Task A;
3. mapping subsurface utilities (water, sewer, cable, etc.) within 500 ft of the Site, including all connections;
4. mapping all properties with basements or sumps.
5. contacting the local fire department about reports of petroleum odors within 500 ft of the Site; and
6. assessing groundwater within each of the Site borings during the LSI implementation for the presence of free product.

Subtask 5: Surface soil receptor survey – A surface soil receptor survey will be conducted to evaluate the potential for contaminated runoff to surface water. Amec Foster Wheeler will identify the areas not covered by an impervious surface and during the site investigation, will field screen surface soil (0-2 feet based on commercial/industrial use of property) using a PID (see Task C).

Subtask 6: Receptor Report and Optimize Investigation Scope – Amec Foster Wheeler will compile findings from the receptor survey activities into the pertinent sections of the LSI report. Amec Foster Wheeler will utilize these findings to optimize the site investigation activities. Based on information for the description of the Site, only six private supply wells exist within 1,000 feet of the Site and therefore, no further sampling would be required. However, if new drilling or sampling locations are warranted based on the identification of additional receptors, Amec Foster Wheeler will consult with the PRP project lead and make recommendations for updates.

Responsible Party(ies): Project Manager, GIS/CADD Specialist, Scientist 1 and 2, Field Technician

TASK C: RISK EVALUATION: SUBSURFACE INVESTIGATION

Following completion of the receptor survey, Amec Foster Wheeler will conduct the subsurface investigation consisting of soil, groundwater and soil vapor sampling. Borings will be advanced as described in MPCA Guidance Document 4-01 Soil and Ground Water Assessments Performed During Site Investigation (PRP4-01).

The LSI will be conducted in the overburden and not bedrock. If significant impacts in overburden (soil and/or groundwater) extends to bedrock, or the proposed sampling locations fail to delineate soil or groundwater extents, an additional investigation may be necessary. Data from the subsurface investigation will be used to determine the potential for or existence of a completed exposure pathway to the identified receptors.

Subtask 1: Prior to conducting field investigation activities, Amec Foster Wheeler will coordinate all Site access agreements including obtaining access from all property owners for all proposed boring locations. Amec Foster Wheeler will obtain all necessary permits.

Amec Foster Wheeler will solicit bids from and contract with a Minnesota State certified contractor for drilling and laboratory services where possible.

Prior to the start of work, Amec Foster Wheeler will have the Site and investigation areas cleared for utilities using Gopher State One Call. Amec Foster Wheeler will also utilize the services of a private utility locator to clear all boring locations on the first day of work.

Subtask 2: Water supply evaluation - As details were given to suggest that private water supply wells are being impacted, immediate sampling of the six identified private supply wells, in addition to any others within 500 ft of the Site, should commence in an effort to protect human health (as detailed in Objective 1, Task A). If analytical results from any of those wells report the presence of recalcitrant petroleum compounds, the area of which to sample private supply wells would be extended to within 1,000 ft of the Site. Based on the given information, Amec Foster Wheeler does not anticipate that further sampling would be necessary.

Subtask 3: Water line permeation evaluation– During the excavation at the dispenser islands responding to the recent release, steps will be taken to locate the public water supply lines running to the onsite buildings from Main Street. In order to assess the permeation of the water lines, hand-driven/augered soil borings will be advanced to determine the magnitude of soil and groundwater contamination in contact with the components. If LNAPL or groundwater are found to be in contact with the water lines, water samples will be collected from the line at the nearest point of use. The water samples (up to two) will be analyzed for VOCs using EPA Method 8260.

Subtask 4: Surface Water evaluation– In order to assess the potential pathway to the lake to the east, a soil boring will be installed between the Site and the Lake. In order to assess the groundwater at that location, the soil boring will be completed as a temporary monitoring well. As downgradient soil/groundwater borings will be installed between the onsite sources and the lake as part of the extent and magnitude determination, the most downgradient boring will be utilized to provide data for the surface water evaluation. If during the receptor survey a storm sewer or other conduit is identified which may provide a pathway to the lake, surface water samples will be collected from the conduit at the nearest downgradient location, or discharge point.

Subtask 5: Vapor evaluation– Immediate attention would be given to the onsite buildings which house the fueling station and restaurant as they provide a receptor within 100 feet of the "worst case" sampling areas. Building surveys will be conducted and explosimeter and PID readings will be taken within the buildings.

Furthermore, soil gas samples will be collected at locations across the site at the "worst case" areas and at any identified receptors within 100 feet. To that end, five boring locations will be advanced to evaluate soil vapor intrusion at the locations shown on Figure 2. If the fueling station is found to have a basement, soil vapor samples associated with the fueling station will be collected at a depth of approximately 8 feet bgs (assuming groundwater is not encountered at or above this interval). The samples collected for association with the slab-on-grade restaurant will be collected from approximately 4 ft bgs. Soil vapor samples completed as sub-slab sample ports inside the buildings will be collected from immediately below the slab of the lowest floor.

- SV-1 will be advanced within the footprint of the dispenser islands to serve as the worst case soil gas sample for Source A;
- SV-2 will be in the utility corridor between Source A and the fueling station to evaluate potential vapor migration into the corridor and towards the receptor;
- SV-3 will be advanced adjacent to the restaurant to evaluate migration from Source A;
- SV-4 will be advanced as a sub-slab sample port and collected beneath the fueling station to evaluate soil gas sample for Source B; and
- SV-5 will be advanced as a sub-slab sample port and collected beneath the restaurant as a worst-case soil gas sample for Source B.
- One duplicate sample will be collected simultaneously at one of the soil vapor sample locations

Direct push drilling methods will be used to advance a retractable sampling tip fitted with inert tubing to the desired depth. Upon setting the tip at the sample depth, a bentonite seal will be placed around the push rod interface with ground surface. Purging will be performed using a graduated syringe and will consist of removing two casing and tubing volumes from the sampling line (casing volume being the volume around the sampling screen at depth). Tubing must be kept closed except when being purged using the syringe.

Samples will be collected into individually-certified clean 6-liter Summa canisters, fitted with an inline 2-micron particulate filter and pressure gauge. The starting canister vacuum will be checked and recorded prior to the sampling train assembly. The sampling train will be assembled with the Summa canister closed. Assembly requires Swagelok compression fittings to ensure a proper seal.

Pending results of the soil gas samples, or even if the defined groundwater plume is found to extend beyond the "worst case" sample locations, additional soil vapor samples will be discussed with the MPCA PRP project staff. Soil vapor sampling procedures will be conducted in accordance with MPCA guidance document PRP4-01a.

Subtask 6: Surface soil evaluation– Limited information will be gleaned from the results of the initial excavation activities at the dispenser islands, as to the impact to surface soils and whether all impacted surface soils were able to be removed. Further screening of the top 2 feet of soil with a PID will be conducted at the site, in the gravel area on the eastern portion of the site, and near the dispenser islands. Analytical samples will be collected at those locations where screening data exceeds applicable screening levels. Soil samples will not be collected at screening locations where the petroleum sheen test result is positive, regardless of PID reading or staining.

Subtask 7: Magnitude of soil contamination and source identification – Six soil borings are proposed to be advanced to identify the magnitude of sources of petroleum impacts at the site. Boring locations are shown on Figure 2. These locations will be revised as necessary to reflect findings from the document review and receptor survey.

- One soil boring will be advanced within the footprint of Source A (SB-1).
- One soil boring will be advanced within the footprint of Source B (SB-2).
- One soil boring each will be installed along the pipe runs servicing source A and B (SB-3 and SB-4)
- One soil boring will be installed at the western UST basin (SB-5)
- One soil boring will be installed at the AST (SB-6)

Soil sampling procedures will be conducted in accordance with MPCA guidance document PRP4-04. The given site information currently only suggests two sources (Source A and Source B), however, this step will confirm if additional sources exists at the site.

Subtask 8: Extent of soil contamination – Soil borings to determine extent will be advanced around the source area soil borings in each of four directions, located within 50 ft of the source borings. Initially, only Source A and Source B will be assessed, and if either field or analytical data suggest it, then other possible sources such as the AST or western UST basin will be assessed as well. Based on the proximity of the source areas to other tank components, some borings may provide horizontal delineation for more than one component, reducing the total number of borings needed. For instance, the boring installed to assess the historic pipe run as a possible source, could also provide information for the eastern extent boring for Source A and the southern extent boring for Source B. Additional borings may be added if subsequent laboratory analysis indicates the extent has not been defined. See Figure 2 for proposed boring locations. Soil sampling procedures will be conducted in accordance with MPCA guidance document c-prp4-04.

- Two additional borings on-Site will be used to delineate the extent of soil impacts from Source A (SB-7 and SB-8), along with previously discussed boring SB-3 and SB-4.
- Three additional borings on-Site will be used to delineate the extent of soil impacts from Source B (SB-9, SB-10 and SB-11), along with previously discussed boring SB-4.
- One additional boring on-Site will be used to provide upgradient information, to assure no impacts originate off-site (SB-12)

Subtask 9: Soil Screening and Sample Collection – Soil sampling procedures will be conducted in accordance with MPCA guidance document PRP4-04. Twelve of the thirteen soil and groundwater borings will be drilled to 5 ft below the water table or 10 ft below the deepest measurable contamination based on observation and PID readings, whichever is deeper. Boring SB-12, the upgradient boring, will be drilled to 20 ft below the water table to serve as a deep stratigraphy boring.

Direct-Push Technology (DPT) drilling methods will be used to advance each boring. At each soil boring location, downhole equipment will be decontaminated using an alconox solution and rinsed prior to use. Soil cores will be continuously recovered using a 4-ft or 5-ft long sampler with disposable liners. New liners will be installed prior to reuse between recoveries.

At regular intervals (approximately every 2 to 5 ft) or where contamination is suspected based on olfactory or visual observation, a soil sample from the core will be screened using a headspace test method and a PID with a 10.6 electron volt (eV) lamp.

Each soil core will be logged using USCS soil classification. A soil sample for grain analysis will be collected from three soil borings, including two shallow soil borings and the deep stratigraphy boring to obtain estimates of hydraulic conductivity.

In each boring, soil samples for laboratory analysis will be collected within the vadose zone at the location of highest PID reading and at the water table. If no contamination is visible or detectable using field screening, only one soil sample will be collected from the interval of the water table. If contamination continues below the water table, a soil sample will be collected from the zone most impacted based on PID reading.

Quality control samples for soil sampling will consist of a laboratory-provided trip blank and up to three duplicate soil samples (1 for every 10 primary soil samples).

Upon reaching total depth at each boring, a temporary groundwater monitoring well will be installed as discussed in Objective 2, Task C, Subtask 10, below.

Soil samples will be collected in laboratory-provided containers and labeled clearly. Samples will be kept on ice in coolers, and will be delivered or shipped to the appropriate laboratory under chain-of-custody procedures within the appropriate hold times.

Soil sample analysis will be performed according to MPCA PRP4-04, and will consist of the following:

- 3 soil samples for grain size analysis
- An estimated 29 samples (up to two samples collected from each of the 13 soil boring locations, plus three duplicates) will be collected for laboratory analysis of:
    - 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, naphthalene, methyl-tertiary-butyl-ether (MTBE) benzene, toluene, ethylbenzene, m&p-xylene, and o-xylene, using EPA Method 8260 for PVOCs; The full VOC suite will not be requested for the soil samples since groundwater samples will be analyzed for VOCs.
    - GRO using Wisconsin (WI) Department of Natural Resources (DNR) Modified GRO Method;
    - DRO using WI DNR Modified GRO Method;
    - Resource Conservation and Recovery Act (RCRA) Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver (only applicable to soil samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown);
    - Polychlorinated Biphenyls (PCBs) using the most recent version of EPA Method 8082 by the Aroclors method (only applicable to soil samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown); and
    - PAHs by EPA Method 8270 if instructed to include by the MPCA project manager.

Soil cuttings and waste water from decontamination will be stored in separate new clean 55-gallon drums. Drums will be clearly labeled, indicating content, date generated, name of the responsible party with contact phone number, and that contents are pending analysis. Waste characterization and disposal is discussed in Subtask 12.

Subtask 10: Groundwater Sampling – Based on the proximity of the Site to the lake, and the shallow nature of the bedrock, it is inferred that groundwater will be encountered during the subsurface investigation activities. Depth to water measurements will be taken and groundwater samples will be collected from each soil boring where water is encountered, by the installation of temporary well screens. Temporary monitoring wells will be installed in boreholes advanced using direct-push drilling equipment. A one-inch diameter, Schedule 40 polyvinyl chloride (PVC) temporary well with a five-foot long, 0.010-inch slot well screen will be emplaced in a soil boring for groundwater sample collection.

A groundwater sample will be obtained from the temporary well or sampling device using a peristaltic pump or tubing equipped with a check valve. New tubing will be used at each groundwater sampling location. One to two volumes of groundwater will be purged from the temporary well or sampling device to reduce turbidity and produce fresh groundwater from the formation for sample collection.

The presence of LNAPL in any of the soil borings will be documented and the MPCA project manager and state duty officer will be contacted. Groundwater sampling procedures will be conducted in accordance with MPCA guidance document c-prp4-05.

Once depth to water has been measured, a low flow sampling method will be employed to collect a groundwater sample. Prior to sampling temporary monitoring wells, a small volume will be purged to reduce sample turbidity, generate effluent for measurement of field parameters, and to remove water that has leaked into the sampling point through probe rod or auger flight joints during installation. Field parameter measurements including specific conductance, temperature, pH, dissolved oxygen, and redox potential will be recorded in the field utilizing a flow cell just prior to sampling or immediately thereafter. Tubing will be discarded after each use.

Groundwater quality control samples will consist of a laboratory-provided trip blank, a laboratory- provided temperature blank, and a duplicate groundwater sample (1 for every 10 primary groundwater samples). Since new tubing will be used each time, no equipment blanks are necessary.

Groundwater samples will be collected into laboratory-provided containers. Groundwater samples will be kept on ice and provided to the laboratory under chain-of-custody procedures within the appropriate hold times.

Water samples will consist of:

- 13 primary groundwater samples and 2 duplicate groundwater samples for:
    - VOCs using EPA Method 8260;
    - GRO using Wisconsin (WI) Department of Natural Resources (DNR) Modified GRO Method;
    - DRO using WI DNR Modified GRO Method;

- Resource Conservation and Recovery Act (RCRA) Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver (only applicable to water samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown);
- Polychlorinated Biphenyls (PCBs) using the most recent version of EPA Method 8082 by the Aroclors method (only applicable to water samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown);
- Low-level analysis for 1,2-dibromoethane (EDB) and 1,2-dibromo-3-chloropropane (DBCP) by EPA Method 8011 (only applicable to water samples related to the extent and magnitude of Source B, as the contents of those USTs was unknown) if instructed to include by the MPCA project manager; and
- PAHs by EPA Method 8270 if instructed to include by the MPCA project manager.

- 1 trip blank for VOCs using EPA Method 8260, GRO using WI GRO, and low-level EDB by method 8011.

Subtask 11: Aquifer Determination – As discussed in Objective 2, Task C, Subtask 9, soil samples from the saturated zone will be collected for grain size analysis to better define the hydrogeologic unit. Hydraulic conductivity and transmissivity will be determined for the impacted hydrogeologic unit.

Subtask 12: Waste Characterization and Disposal - Soil cuttings and waste water from decontamination will be stored in separate new clean 55-gallon drums. Drums will be clearly labeled, indicating content, date generated, name of the responsible party with contact phone number, and that contents are pending analysis.

Each waste stream will be sampled by collecting a composite soil or water sample from each set of drums. Drums will be closed and stored on-Site at a suitable location pending disposal once waste results are available.

Waste characterization samples will be collected in laboratory-provided containers, kept on ice, and provided to the laboratory following chain-of-custody procedures.

Soil waste characterization samples will be analyzed for PVOCs using EPA Method 8260, GRO using WI DNR Modified GRO Method, DRO using the WI DNR Modified DRO Method and RCRA metals using EPA Method 6010B / 7471.

Water waste characterization samples will be analyzed for VOCs using EPA Method 8260, GRO using WI DNR Modified GRO Method, DRO using the WI DNR Modified DRO Method and RCRA metals using EPA Method 6010B / 7471.

Responsible Party(ies): Project Manager, Scientist 1 and 2, Field Technician, GIS/CADD Specialist

TASK D: DEVELOP A CONCEPTUAL SITE MODEL (CSM)
The CSM will be prepared using the initial excavation data, site receptor survey, private well results and the site investigation data. Each media type will be assessed and conclusions will be drawn as to the presence of completed pathways to receptors.

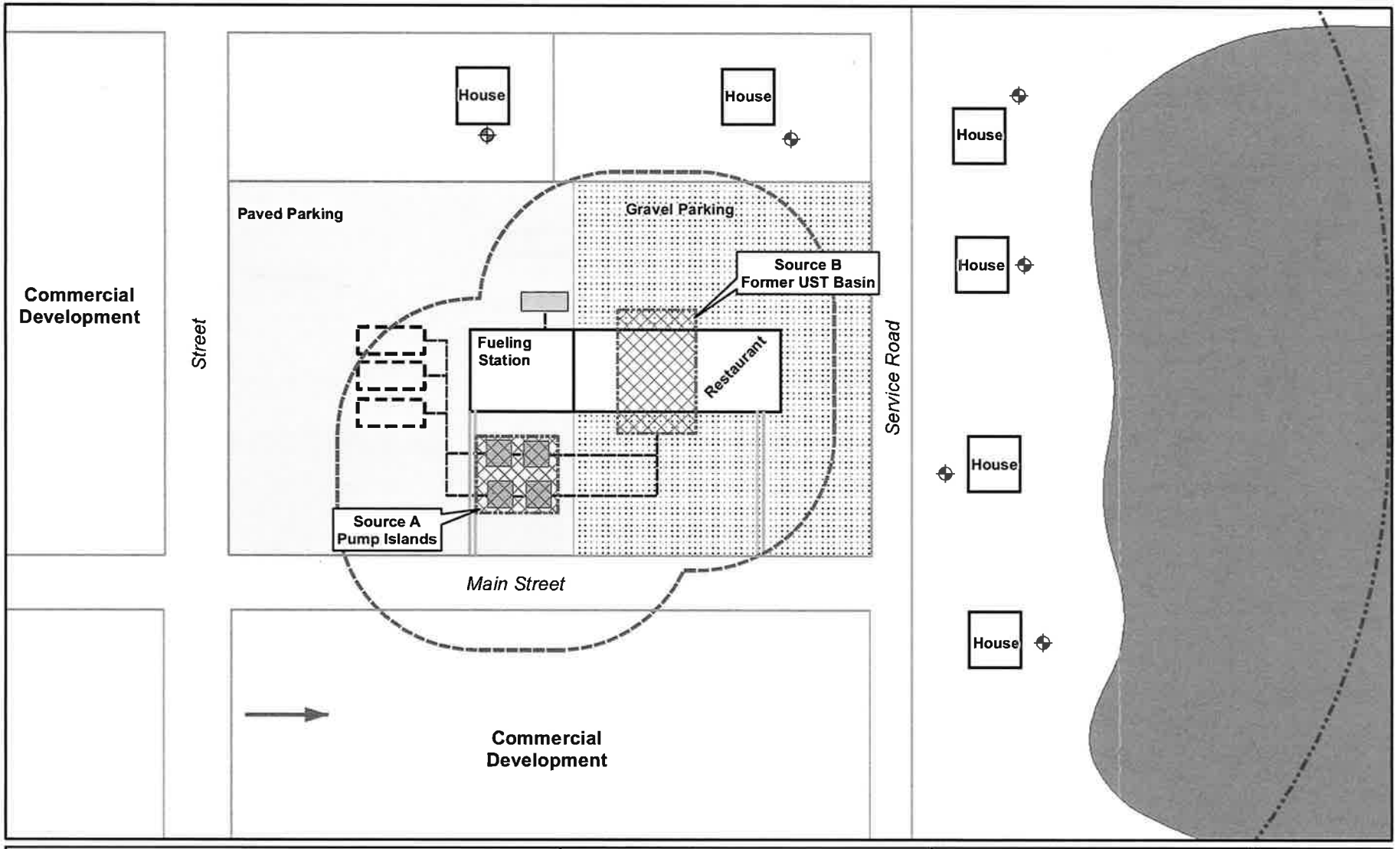
Responsible Party(ies): Project Manager, Scientist 1 and 2, GIS/CADD Specialist

TASK E: SITE MANAGEMENT DECISION.
The information provided in Scenario B does not give enough data to justify how to manage the site. The tasks that Amec Foster Wheeler has described to this point will provide enough information to determine how to manage the Site going forward, once data is received from the completed LSI. Impacts including water supply, vapor, surface water and surface soil will be weighed, as will the presence of free product or plume stability. Each of those factors will determine whether site closure is applicable, or whether a monitoring plan or corrective action would be required.

Responsible Party(ies): Project Manager, Scientist I, GIS/CADD Specialist

Objective 2 Timeline: Approximately 2 months (pending degree of contamination and need for delineation of extent)
Objective 2 Deliverables:

- (updated) Investigation Report (Guidance Document 4-06)
- Petroleum Release Notification Follow-up (Guidance Document 2-08)



Legend

- Domestic Supply Well
- Inferred Petroleum Pipe Run
- Water Line
- Sewer Line
- Inferred Groundwater Flow Direction
- Gas and Diesel UST
- Fuel Oil AST
- Pump Islands
- Contamination Source
- Source Areas 100-foot
- Source Areas 500-foot

SITE PLAN

Remediation Master Contract Proposal
Scenario B
Minnesota Pollution Control Agency

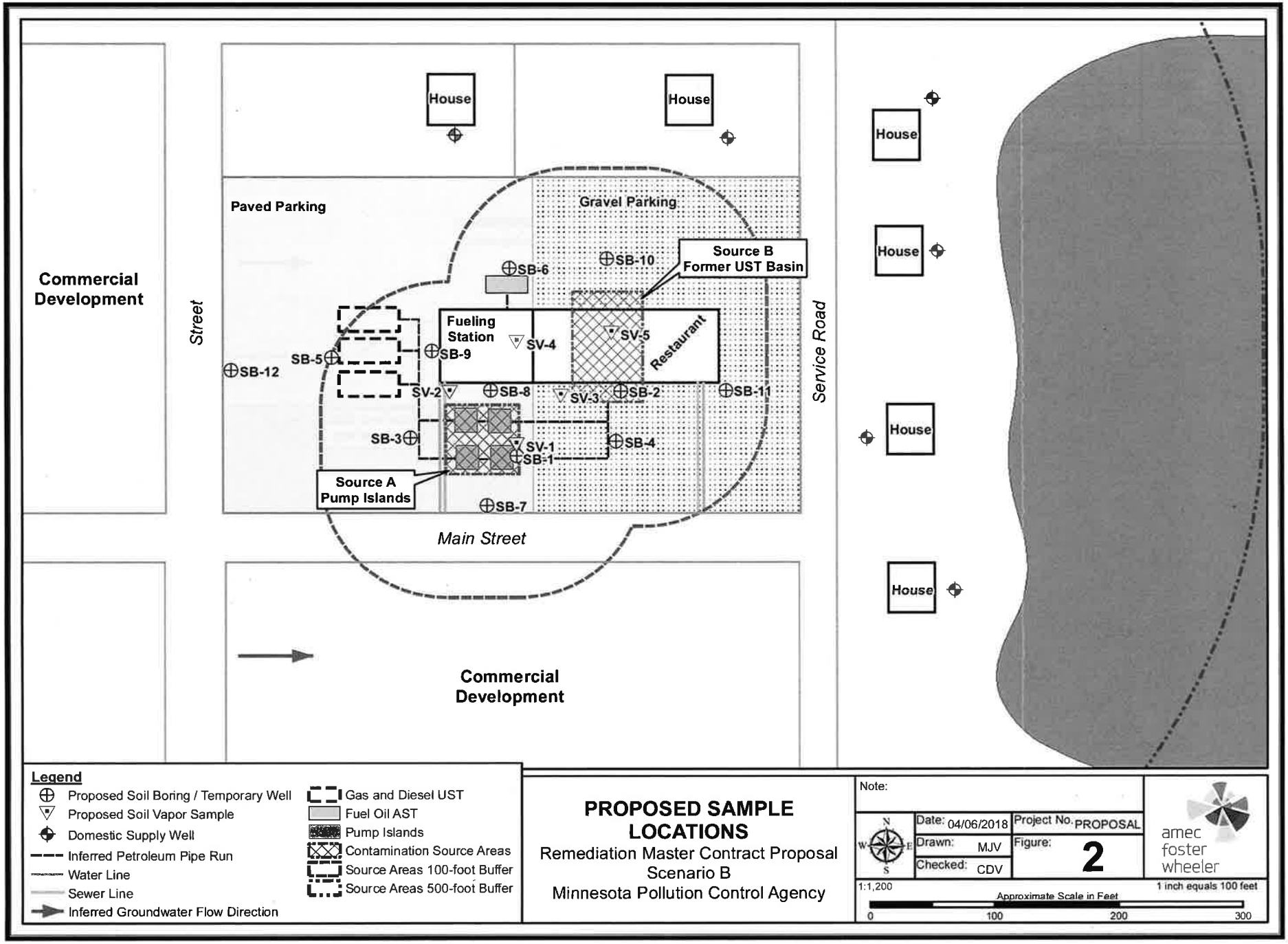
Note:

Date: 04/06/2018	Project No. PROPOSAL
Drawn: MJV	Figure: 1
Checked: CDV	

1:1,200 — 1 inch equals 100 feet

Approximate Scale in Feet: 0 100 200 300

amec foster wheeler

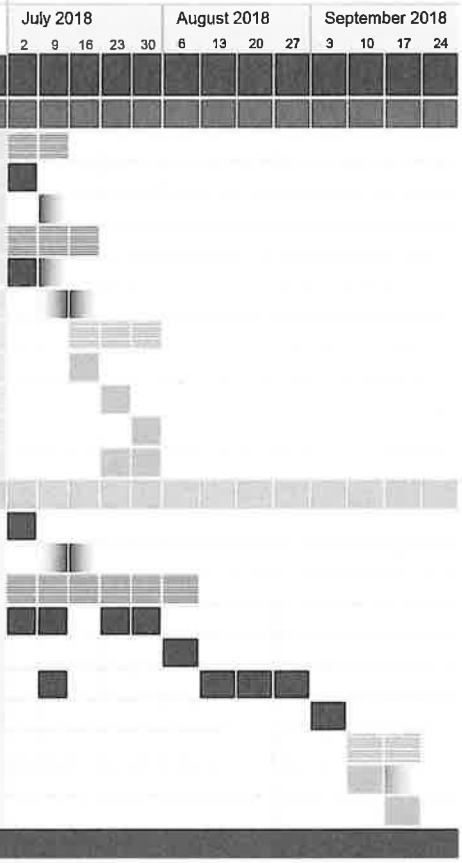

Commercial Development
Street
House
House
Paved Parking
Gravel Parking
SB-6
SB-10
Source B
Former UST Basin
Fueling
Station
SV-4
SV-5
Restaurant
SB-5
SB-9
SB-12
SV-2
SB-8
SV-3
SB-2
SB-11
SB-3
SV-1
SB-1
SB-4
Source A
Pump Islands
SB-7
Main Street
Service Road
House
House
House
House
Commercial
Development
Legend
Proposed Soil Boring / Temporary Well
Proposed Soil Vapor Sample
Domestic Supply Well
Inferred Petroleum Pipe Run
Water Line
Sewer Line
Inferred Groundwater Flow Direction
Gas and Diesel UST
Fuel Oil AST
Pump Islands
Contamination Source Areas
Source Areas 100-foot Buffer
Source Areas 500-foot Buffer
PROPOSED SAMPLE LOCATIONS
Remediation Master Contract Proposal
Scenario B
Minnesota Pollution Control Agency
Note:
N
W
E
S
Date: 04/06/2018
Project No. PROPOSAL
Drawn: MJV
Figure: 2
Checked: CDV
amec foster wheeler
1:1,200
1 inch equals 100 feet
Approximate Scale in Feet
0
100
200
300

Scenario B - Petroleum Only Environmental Services - Generalized Schedule

Amec Foster Wheeler
Cory Vowles

Project Start: Mon, 7/2/2018

TASK	ASSIGNED TO	PROGRESS	START	END
Objective 1 - Immediate Action				
Task A - Private Well Sampling	PM, GIS, S1, FT	0%	7/2/18	7/18/18
Prep/Access/HASP	PM, GIS, S1	0%	7/2/18	7/6/18
Fieldwork	PM, S1, FT	0%	7/9/18	7/10/18
Task B - Soil Excavation	PM, GIS, S1, S2, E2	0%	7/2/18	7/20/18
Prep/Procurement	PM, GIS, S1, S2, E2	0%	7/2/18	7/11/18
Fieldwork	PM, S1, S2	0%	7/11/18	7/18/18
Objective 1 - Deliverables	PM, GIS, S1, E2	0%	7/18/18	8/3/18
Analytical Summary	PM, GIS, S1, E2	0%	7/18/18	7/18/18
Corrective Action Excavation Report Worksheet	PM, GIS, S1, E2	0%	7/23/18	7/27/18
Petroleum Release Notification Follow-up	PM, GIS, S1, E2	0%	7/30/18	8/3/18
General Excavation Report	PM, GIS, S1, E2	0%	7/23/18	8/3/18
Objective 2 - Conduct LSI				
Task A - Document Search/File Review	PM, GIS, S1	0%	7/2/18	7/6/18
Task B - Receptor Survey	PM, S1, FT	0%	7/11/18	7/18/18
Task C - Subsurface Investigation	PM, GIS, S1, S2, FT	0%	7/2/18	8/10/18
Prep/Procurement	PM, GIS, S1, S2, E2	0%	7/2/18	7/20/18
Fieldwork	PM, S1, S2, FT	0%	8/6/18	8/10/18
Task D - Develop CSM	PM, GIS, S1, S2, E1, E2	0%	7/9/18	8/31/18
Task E - Site Management Decision	PM, GIS, S1	0%	10/15/18	10/22/18
Objective 2 - Deliverables	PM, S1, GIS	0%	10/22/18	10/31/18
Investigation Report	PM, S1, GIS	0%	9/10/18	9/20/18
Petroleum Release Notification Follow-up	PM, S1, GIS	0%	9/17/18	9/21/18



Prjoect Roles include:

PM - Project Manager
S1 - Scientist 1
S2 - Scientist 2
E1 - Engineer 1
E2 - Engineer 2
GIS - GIS/CADD Specialist
FT - Field Technician

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Project title: Scenario B - Petroleum Only Environmental Services - Labor Effort Only

Project Budget	1. Personnel					Labor Totals by Phase
	Level One			Level Two	Level Three	
	Field Technician	GIS/CADD Specialist	Scientist 1	Scientist 2	Project Manager	
Objective 1 - Interim Corrective Actions						
Task A - Private Supply Well Sampling	10	2	10		2	24
Task B - Excavation		4	20	32	2	58
Total Hours for Objective 1	**10**	**6**	**30**	**32**	**4**	**82**
Objective 2 - Conduct LSI						0
Task A - Desktop File Review			4		1	5
Task B - Risk Eval - Receptor Survey	2		12		1	15
Task C - Risk Eval - Subsurface Investigation	2	2	48	15	4	71
Task D - Develop CSM		4	4	6	2	16
Task E - Site Management Decision				2	1	3
Total Hours for Objective 2	**4**	**6**	**68**	**23**	**9**	**110**
PROJECT TOTALS	**14**	**12**	**98**	**55**	**13**	**192**