Proposal for

Minnesota Pollution Control Agency Remediation Master Contract

Category C – Closed Landfill Program Environmental Services

April 11, 2018

Brian A. Ross, PG, VP
Project Manager | Scientist II
218.316.3628
Brian.Ross@wsn.us.com

7804 Industrial Park Rd.
Baxter, MN 56425

WIDSETH SMITH NOLTING

Engineering | Architecture
Surveying | Environmental

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WIDSETH SMITH NOLTING

Brainerd/Baxter
7804 Industrial Park Road
PO Box 2720
Baxter, MN 56425-2720

218.829.5117
218.829.2517
Brainerd@wsn.us.com

WidsethSmithNolting.com

April 10, 2018

Ms. Mary Heininger
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

RE: Proposal for Category C. Closed Landfill Program Environmental Services

Dear Members of the Evaluation Team:

Category | We have enclosed our qualifications for Category C. Closed Landfill Program Environmental Services

History | Widseth Smith Nolting (WSN) is a Minnesota corporation, founded in 1975 in Crookston. The firm has expanded by acquiring Dean Anderson of Brainerd, 1978, Hall Engineering, Alexandria, 1979, QED Engineering, Rochester, 2008, FS Engineers, East Grand Forks, 2012, KBM Inc. IN 2016; diversifying into Environmental Services, 1989; and opening new offices in Grand Forks, 1998, Bemidji, 1999, and Forest Lake, 2016. Now with more than 200 employees, our team of professionals—environmental scientists, engineers, architects, and land surveyors—works together to provide our clients with comprehensive, coordinated services. As a Minnesota-based company, WSN serves rural and urban areas throughout the state. Our website address is: www.widsethsmithnolting.com

Organization | WSN is owned by senior-level employees who maintain active roles in their professions, their communities, state organizations, and in the company's management team. The organization is run by a board of directors comprised of WSN employees. The President and Secretary are located in the Baxter office, and the Executive Vice President and Treasurer are in Alexandria. Our Crookston location serves as the firm's business office, where our financial records are kept.

Project Contact | As Vice President and Director of Environmental Services, I will serve as the contact person regarding questions on this proposal as well as be responsible for overall contract administration and quality control. My contact information is as follows:

Brian A. Ross, PG
7804 Industrial Park Road
Baxter, MN 56425
Direct | 218.316.3628
General | 218.829.5117
Mobile | 218.821.3697
Fax | 218.829.2517
Email | Brian.Ross@wsn.us.com

Locations | Projects under this contract will be managed out of our Brainerd/Baxter office with staff/teams mobilizing from the following locations:

Brainerd/Baxter
7804 Industrial Park Road
Baxter, MN 56425
TEL | 218.829.5117
FAX | 218.829.2517

Crookston
216 South Main Street
Crookston, MN 56716
TEL | 218.281.6522
FAX | 218.281.6545

Alexandria
610 Fillmore Street
Alexandria, MN 56308
TEL | 320.762.8149
FAX | 320.762.0263

Day-to-Day Availability | WSN's multiple locations give the firm the proximity, flexibility, and resources to quickly and effectively serve the Contract users. One of our proposed Project Managers and I are located just two blocks from the MPCA Brainerd Regional Office, making us available to meet with MPCA staff on relatively short notice. All of our team members, of course, would be available for scheduled meetings as needed regardless of location. In terms of

discussing such issues as billing and invoicing as well as general issues or information, current technologies (e.g., e-mail, mobile devices, etc.) render physical proximity nearly moot. Contract users will be provided with the contact information needed to reach our team members as appropriate.

Contract Conditions I WSN accepts the Classification Levels and Rates in both Rate Schedule 1 and Rate Schedule 2 in the RFP/Event dated February 28, 2018. We also accept the Equipment and Supplies List, which lists the equipment to perform services with prices per RFP Addendum No. 1.

Contract Experience I WSN appreciates the work given to us by MPCA over the last five years of the Professional and Technical Services Master Contract and the previous five years of the Multi-Site Contract. We have worked with MPCA Superfund Staff in both the Duluth and St. Paul offices and have worked on over half-dozen Superfund program projects for MPCA in Minnesota communities. We are familiar with Miinnesota's geologic and hydrogeologic characteristics and have over thirty years of environmental investigation and remediation services experience. Using WSN is cost effective because of familiarity with central and northern Minnesota and our office locations in central, north central, and northwestern Minnesota. We would like very much to continue this relationship for the next five-year contract period.

Erosion/Sediment Control Certification Program | More than 40 of WSN's employees have been certified through the University of Minnesota Erosion/Sediment Control Certification Program in construction SWPPP design, construction installation, and construction site management. All certifications are up to date.

We look forward to providing the state with continued high quality, knowledgeable, efficient, and effective environmental services.

Sincerely,
WIDSETH SMITH NOLTING & ASSOCIATES, INC.

Brian A. Ross, PG
Vice President | Director of Environmental Services
Brian.Ross@wsn.us.com

1. Qualifications and Capabilities

Overall Company Capabilities

Widseth Smith Nolting & Associates, Inc.

Good roads, clean water, safe bridges, dynamic spaces, and robust communities are central to our quality of life. Widseth Smith Nolting supports our communities through engineering, architecture, land surveying, and environmental services for public and private clients throughout the Upper Midwest. With more than 200 employees working from eight locations in Minnesota and North Dakota, our integrated multi-discipline team offers a complete package of services to take your project from concept to completion. For you, that means better communication, greater efficiency, and a more satisfying experience. Firm-wide Widseth Smith Nolting's disciplines and staff include:

27 Architecture | 74 Civil Engineering | 4 Structural Engineering
6 Mechanical Engineering | 10 Electrical Engineering | 35 Land Surveying
8 Environmental Services | 7 Water Resources | 2 Funding Specialists
4 Communications | 24 Administrative | 201 Total Employees

Firm History

2016 WSN's services expand to include electrical distribution operations planning and construction design engineering through acquisition of KBM, Inc.
2016 KBM Geospatial LLC added as a subsidiary of WSN
2016 Forest Lake added through acquisition of Hult & Hebeisen
2014 Rochester architecture team expanded through acquisition of Kane and Johnson Architects, Inc.
2013 Brainerd architecture team expanded through acquisition of Architecture One
2012 East Grand Forks is added through acquisition of FS Engineering
2010 WSN's services expand to include water resources through acquisition of JOR Engineering
2008 Rochester added through merger with QED Engineering
1999 Bemidji opens
1999 Brainerd expands through acquisition of EDC Engineering
1998 Grand Forks opens
1996 Brainerd expands through acquisition of Meyer Donnay Architects
1979 Alexandria is added through acquisition of Hall Engineering
1978 Brainerd is added through acquisition of Dean Anderson
1975 Widseth Smith Nolting & Assoc., Inc., is incorporated

Key Staff

Resumes for all key staff are included on the subsequent pages, followed by the Staff Matrix.

Brian A. Ross, PG
Project Manager
Brian.Ross@wsn.us.com

7804 Industrial Park Road
Baxter, MN 56425
218.829.5117

WSN Office Locations

Alexandria
Bemidji
Baxter/Brainerd
Crookston
East Grand Forks
Forest Lake
Grand Forks
Rochester

Key Staff

Brian A.Ross, PG, VP— Project Manager | Scientist 2

Brian joined WSN in 1991, after six years with a Twin Cities environmental consulting firm. He has extensive experience in site investigation activities including sludge, sediment, soil, surface water and groundwater sampling as well as soil boring logging, monitoring well installation, and aquifer testing. Brian has conducted over 30 investigations of Superfund-type contamination and has experience with response action oversight and remedial actions.

Brian has completed assessments or investigations at more than three dozen RCRA hazardous waste sites around the U.S. He has been involved in pesticide release studies, numerous Phase I and II environmental site assessments, and provided input for Environmental Impact Statements (EIS). His extensive background in hydrogeologic studies and computer modeling of groundwater flow for municipal water wells includes evaluating aquifer characteristics, siting new well fields, designing new wells, delineating wellhead protection areas, and assessing water quality. As project director, Brian has directed all aspects of several projects, from client communication to arranging subcontractors.

Licenses/Certifications

Professional Geologist: MN

Licensed Monitoring Well Contractor

40-Hour OSHA HAZWOPER Training

HAZMAT Site Supervisor Training

Education

MS, Geology | University of Minnesota, 1985

BA, Earth Science | St. Cloud State University, 1981

RELATED PROJECTS

Petroleum Release Sites

- Johnson Cardtrol (Leak Site 20336) — Kennedy, MN, Site Assessment, LSI
- Tom's Resort (Leak Site 16414)—Cass Lake, MN
  Phase I and II ESA, Remedial Investigation, CAD Report (Excavation)
- Gooseberry Falls State Park (Leak Site 9434)—Two Harbors, MN
  UST Removal, Full RI, CAD Report, CAD Install and O&M
- Aitkin Power Plant (Leak Site 8566)—Aitkin, MN
  Emergency Response, Full RI, CAD Report, CAD Install and O&M
- Former Garrison Conoco (Leak Site 16532)—Garrison, MN
  Remedial Investigation
- Mills Fleet Farm (Leak Site 15260)—Owatonna, MN
  UST Removal, Limited Site Investigation
- Former Auto Import Dealership (Leak Site 8234)—Grand Rapids, MN
  Remedial Investigation
- Arneson Direct Service (Leak Site 14817)—Roseau, MN
  UST Removal, Remedial Investigation
- Spicer Fisheries Headquarters (Leak Site 5932)—Spicer, MN
  UST Removal, Full RI, CAD Installation and O&M
- Edwards Oil Bulk Site Corrective Action (Leak Site 5794)—Virginia, MN
  Corrective Action Design, Free Product Recovery, Soil Excavation
- Mills GM (Leak Site 15267)—Baxter, MN
  UST Removal, Limited Site Investigation
- Aitkin County Retention Pond (Leak Site 16050)—Aitkin, MN
  Vapor Survey, Utility Right-of-Way Excavation
- Sobieski Coop (Leak Site 5864)—Sobieski, MN
  CAD Report, CAD Installation and O&M
- Holiday Station Store 369 (Leak Site 18101) - Baxter, MN, Remediation System Design Review

Non-Petroleum Contamination Sites

- Bemidji South Shore Development (Site ID VP14403)—Bemidji, MN
  VIC Investigation Workplan, DRAP Preparation, DRAP Implementation
- Former IGA (Site ID VP-13440)—Little Falls, MN
  UST Removal and Remedial Investigation of PCE Release
- Crookston Iron and Metal (Site ID VP-20380)—Crookston, MN
  CERCLA Investigation and Corrective Action
- Well Replacement—Randall, MN
  Nitrate Assessment, Well Siting and Design, Pumping Test Assessment

Brian Ross continued on the next page

- Former Arrowhead Cleaners (Site ID SA4392)—Grand Rapids, MN
  Phase I and II ESA, Superfund Assessment
- Pequot Publishing (Site ID11400)—Pine River, MN
  Phase I and II ESA, VIC Investigation Workplan, Corrective Action
- Dan's Flying Service (MDA Case File No: CF-2692)—Crookston, MN
  Ag-Chem Phase I, Remedial Investigation, Corrective Action
- Homecrest Industries (Site ID 11500)–Wadena, MN
  Phase I and II ESAs, VIC Investigation
- Former Cedar Services (Site ID GCH255104)—Bemidji, MN
  Remedial Investigation and Monitoring
- Nitrate Assessment—Verndale, MN
  Nitrate Contamination Mapping, Monitoring Well Installation, Pumping Test Assessment
- Biwabik City Hall—Biwabik, MN
  Limited Phase 2 ESA, Assessment work plan,sampling assessment report

Phase I and Phase II Environmental Site Assessments

- MnDOT TH 7/29 Bypass (S.P. 1202-48)—Montevideo, MN
  Phase I ESA, Drilling Investigation
- Mills Fleet Farm—Rochester, MN
  Phase I ESA
- Lexington Manufacturing—Brainerd, MN
  Phase I ESA
- MnDOT Th1/59—Thief River Falls, MN
  Phase 1 and Phase II ESA
- J.R. Simplot Facility—Grand Forks, ND
  Phase I and II ESA
- Former Standard Oil Bulk Site—Aitkin, MN
  Phase I and II ESA
- MNDOT TH 71 Bridge Project—Jackson, MN
  Phase I and Phase I ESA
- Kruse and K&S Motors—Worthington, MN
  Phase I ESA
- Roadway Turnback Project—Pequot Lakes, MN
  Limited Phase I ESA and Phase II Drilling
- Parker-Hannafin Facility—Deerwood, MN
  Phase I ESA, Oil System Removal Assessment

Other Projects

- Municipal Well Assessment and Design—Watson, MN
  New Well Siting, Test Well Design, New Well Plans and Specifications
- Pequot Lakes WWTF Irrigation Study—Pequot Lakes, MN
  Hydrogeologic Study, Nitrate Contamination Assessment
- Municipal Well Replacement—Kerkhoven, MN
  Arsenic Assessment, New Siting and Design, Plans and Specifications
- Ruttgers Bay Lake Townhomes—Deerwood, MN
  Phosphorus and Nitrate Contamination Study
- CSAH 31 Groundwater Seepage Study—Pillager, MN
  Geotechnical Study
- Municipal Well Replacement—Herman, MN
  Design, Plans Specifications
- Municipal Well Replacement—Holloway, MN
  Nitrate Assessment, Hydrogeologic Assessment, new well siting and Design

Licenses/Certifications

Professional Engineer: MN, WI

Education

BS, Civil Engineering
North Dakota State University, 1979

Mark V. Hallan, PE, VP — Engineer 4

Mark joined WSN in 1996 with 17 years of experience in civil and structural engineering projects. As a project engineer with WSN, Mark advises city staff and councils on infrastructure considerations to meet projected growth, the impact of development on existing city systems and funding/assessment alternatives. As a principal in the firm, he is responsible for coordination, design, approvals, construction observation and quality control for water, wastewater, solid waste facilities and street/highway projects. In addition, projects with Camp Ripley have varied from vehicle/tank wash facilities with petroleum, oil, lubricant capture and water reuse to specialized stormwater treatment. Mark further manages WSN's project teams assigned to the preparation of feasibility studies or facility plans, preliminary and final plans/specifications, and construction observation. Mark also represents WSN's clients in all negotiations with State and Federal agencies and prepares permit applications for a variety of agencies.

RELATED PROJECTS

Corrective Action Design Systems

- Hansel Residence (Site ID 19251)—Dalton, MN
  Corrective Action Design Plans and Specifications
- Hutto Residence (Leak Site 17206)—Anoka, MN
  Corrective Action Design, Plans, and Construction Observation
- Dillon Residence (Leak Site 15589)—Paynesville, MN
  Corrective Action Design, Plans, and Construction Observation
- Lamia Ali Residence (Leak Site 17116)—Moorhead, MN
  Corrective Action Design, Plans, and Specifications
- Meyer Residence (Leak Site 13656)—Easton, MN
  Corrective Action Design, Plans, and Specifications
- LaFave Residence (Leak Site 16755)—St. Paul, MN
  Corrective Action Design, Plans, and Construction Observation
- Duncan Residence (Leak Site 5291)—Minneapolis, MN
  Vapor Mitigation System Operation and Maintenance
- Osvold Residence (Leak Site 15602)—Brainerd, MN
  Vapor Survey, LSI, CAD, Vapor Mitigation Construction
- Captain Kirks (Leak Site 464)—Federal Dam, MN
  Corrective Action Design and Implementation, Contaminated Soil Removal

Other

- New Well Review (Leak No. 8524)—Pelican Rapids, MN
  Review Well and Water System Problems with MPCA Staff
- Aitkin County CSAH 1 Rebuild with Contaminated Soils Removal—Aitkin, MN
- Aitkin Bunker Hill Drive Industrial Park—Aitkin, MN
- Aitkin Power Plant Decommissioning Assessment—Aitkin, MN
- Bemidji Water Tower #3—Bemidji, MN
- Municipal Well Replacement and Plant Upgrade—Blackduck, MN
- Camp Ripley Concrete Parking for Building 11-76—Little Falls, MN
- Camp Ripley Outfall #1 Stormwater Treatment System—Little Falls, MN
- Camp Ripley Washrack No. 22 Modifications—Little Falls, MN
- Crosslake/Crow Wing County Joint Public Works Facility—Crosslake, MN
- Crow Wing County Landfill Cells 3 and 4 Construction—Brainerd, MN
- Crow Wing County Landfill Methane Gas Collection—Brainerd, MN
- Hancock Water and Sewer Systems—Hancock, MN

Mark V. Hallan continued on the next page

- Henning Water System Improvements—Henning, MN
- Laporte Water Plant Construction Review—Laporte, MN
- Little Falls Ethanol Plant Sewer and Water Extension—Little Falls, MN
- Lindbergh Drive Reconstruction with Contaminated Soils Removal—Little Falls, MN
- McLeod County Household Hazardous Waste Facility—Hutchinson, MN
- Nisswa Wastewater Irrigation Improvements—Nisswa, MN
- NPC Sewer and Water Extensions with Asbestos Removal—Brainerd, MN
- Pequot Lakes Water System—Pequot Lakes, MN
- Long Prarie Creamery (Leak Site 155)—Long Prarie, MN
  Building Structural Evaluation

Licenses/Certifications

Professional Geologist: MN

40-Hour OSHA HAZWOPER Training

Education

BS, Geological Engineering
University of North Dakota, 1987

AAS, Diversified Agriculture
University of Minnesota-Crookston, 1978

Gregory W. Smith, PG — Project Manager | Scientist 2

Before joining WSN in 1989, Greg was part of an environmental consulting firm in Wayzata, MN. His project experience at WSN includes Phase I and Phase II environmental site assessments, hydrogeologic investigations at petroleum and non-petroleum release sites, oversight of tank removal projects, and groundwater monitoring system design at demolition landfills. Greg is responsible for the coordination of field activities at the landfills including groundwater sample collection, hydrogeologic evaluations, and monitoring well system design. Due to the high number of monitoring wells at the landfills, he is tasked to retrieve, interpret, and collate a large amount of data results on a quarterly basis.

Greg's general responsibilities at WSN include data analysis, interpretation of field data, and effective verbal and written communication with clients and regulators. He prepares technical documents including well installation work plans, remedial investigation reports, and corrective action design reports. Greg is also responsible for providing leadership to other team members to make sure the investigation is moving toward a successful outcome while complying with local, state, and federal regulations and MPCA guidance documents. As the project manager for a wide variety of projects Greg has the ability to organize differing amounts of technical data to make concise and final recommendations.

RELATED PROJECTS

Corrective Action Design Systems

- Hansel Residence (Site ID 19251)—Dalton, MN
  Contaminated Soil Excavation, Vapor Mitigation
- Triangle Oil (Site ID 13383)—Brainerd, MN
  CAD Report, DPE System Design, Install and O&M
- Hutto Residence Corrective Action (Site ID 17206)—Anoka, MN
  Corrective Action Design, Plans, and Construction Observation
- Izaty's Golf & Yacht Club (Site ID 10651)—Onamia, MN
  Drinking Water Well Replacement
- Johnson's Services (Site ID 11617)—Carbon Filter System
  Design, Installation, and O&M

Petroleum Release Sites

- Woitalla Repair Services (Site ID 20585)—Pierz, MN
  Limited Site Investigation
- D&G Auto Repair (Site ID 20306)—Sauk Rapids, MN
  Limited Site Investigation
- Sebeka Public Schools (Site ID 16142)—Sebeka, MN
  Limited Site Investigation
- Melrose Motors (Site ID 17938)—Melrose, MN
  Remedial Investigation
- Ray's Service (Site ID 12719)—Meire Grove, MN
  Remedial Investigation
- Polish Palace (Site ID 11420)—Sobieski, MN
  Remedial Investigation, Free Product Recovery
- Driftwood Family Resort (Site ID 17427)—Pequot Lakes, MN
  Remedial Investigation
- Southside Fuel Plus (Site ID 18065)—Hackensack, MN
  Remedial Investigation
- JL Enterprises (Site ID 17039)—Aitkin, MN
  UST Removal Observation, Excavation Report Preparation
- Johnson Oil Bulk Site (Site ID 15217)—Pine River, MN
  Surface Soil Contamination Assessment
- Izaty's Golf & Yacht Club (Site ID 10651)—Onamia, MN
  Remedial Investigation
- Woodland Store (Site ID 9247)—Lake George, MN
  Remedial Investigation

Gregory W. Smith continued on the next page

- Otter Tail County Garage (Site ID 14493)—Fergus Falls, MN
  Limited Site Investigation, Contaminated Soil Land Treatment
- Johnson's Services (Site ID 11617)—Motley, MN
  Remedial Investigation, Drinking Water Well Replacement

Non-Petroleum Contamination Sites

- Hengel Demolition Landfill (SW-291)—Pillager, MN
  Vinyl Chloride Groundwater Contamination Investigation
- Douglas County Demolition Landfill (SW-406)—Alexandria, MN
  Boron and Manganese Groundwater Contamination Investigation
- Former Brainerd City Dump—Baxter, MN
  Methane Gas Migration Investigation
- Pine River Wood Products—Pine River, MN
  Pesticide Release Investigation (MDA Site)
- Jim's Auto Parts & Salvage—Little Falls, MN
  Subsurface Investigation Work Plan Preparation
- Rudy's Auto Body—Crosslake, MN
  Cleaning Solvent Subsurface Investigation
- Army Corps of Engineers—Red Lake Falls, MN
  Health and Safety Plan Preparation
- Runestone Electric—Alexandria, MN
  VIC Work Plan Preparation, Investigation
- Crow Wing County Landfill (SW-376)—Brainerd, MN
  Leachate Collection, Groundwater Sampling, Report Preparation
- TK Demolition Landfill (SW-333)—Cold Spring, MN
  Landfill Permitting, Groundwater Monitoring System Design
- Wadena County Demolition Landfill (SW-317)—Wadena, MN
  Landfill Permitting, Report Preparation
- Former Brainerd Foundry—Brainerd, MN
  Lead Contamination Investigation, Feasibility Study Preparation

Phase I and Phase II Environmental Site Assessments

- Maple Street Dental—Brainerd, MN
  Phase I ESA
- Houston Ford—Pine River, MN
  Phase I ESA
- MnDOT TH 72 Road Improvements—Kelliher, MN
  Phase I and II ESA
- Former Thorud Motors—Alexandria, MN
  Phase I and Phase II ESA, Excavation
- MnDOT TH 10 Bypass Alternatives (S.P. 5605-18)—Wadena, MN
  Limited Phase I ESA
- MnDOT—Lindstrom, MN
  Phase I ESA
- MnDOT Trunk Highway 371 Bypass—Pequot Lakes, MN
  Phase I ESA
- United Building Center—Brainerd, MN
  Phase I and II ESA
- Izaty's Golf & Yacht Club—Onamia, MN
  Phase I and II ESA
- Headwaters Revolving Loan Fund—Bemidji, MN
  Phase I and II ESA
- Crow Wing Power ESA—Little Falls, MN
  Phase I ESA

Ty J. Fuglseth, PG — Project Manager | Scientist 2

Ty joined WSN in 1995, after two years as an environmental scientist/project manager with a North Carolina environmental consulting firm. He specializes in performing site assessments and investigations involving environmental contamination issues. Responsibilities at WSN include project management, bidding, contractor selection, communication with clients and state agencies, site assessments, site investigations, monitoring, data analysis and interpretation, risk assessment, client and state regulatory compliance, and remediation. Ty has directed numerous tank removals, remedial investigations, contaminated soil excavations, hydrogeologic studies, and environmental site assessments. Ty is experienced in managing and performing all aspects of fieldwork, including utility locating, soil boring advancement, monitoring well installation, soil, groundwater, surface water, and vapor sampling, risk assessments, free product recovery, and aquifer testing in accordance with applicable guidance documents. He also prepares technical reports including Limited Site Investigations/ Remedial Investigations, Hydrogeological Characterization Reports, Phase I and II Assessment Reports, and Asbestos Inspection Reports.

Licenses/Certifications

Professional Geologist: MN

40-Hour OSHA HAZWOPER Training

Certified Asbestos Inspector

Certified Lead Risk Assessor

Education

MS, Geology | University of South Carolina, 1991

BS, Geology | North Dakota State University, 1987

RELATED PROJECTS

Petroleum Release Sites

- Former Sioux Old Retail Site (Site ID 5736)—Winger, MN
  LSI & Corrective Action
- Former Gateway Super Service (Site ID 18412)—Kennedy, MN
  LSI, Sub-Slab Vapor Monitoring, Indoor Air Sampling
- Riverside Bait & Tackle (Site ID 16016)—Warroad, MN
  Groundwater Monitoring, LIF Investigation, Monitoring Reports, and EDCAD Preparation
- Knife River Materials (Site ID 17593)—Bemidji, MN
  Remedial Investigation
- Anderson Oil (Site ID 13524)—Red Lake Falls, MN
  Additional Investigation, Groundwater Monitoring, Vapor Assessment
- Percy's Place (Site ID 11966)—Roosevelt, MN
  Remedial Investigation, Drinking Water Well Sampling, Sub-Slab Vapor Sampling & Assessment
- Anda Construction, Townview Apartments (Site ID 17650)—Red Lake Falls, MN
  Limited Site Investigation
- Bumper to Bumper (Site ID 15344)—Greenbush, MN
  Limited Site Investigation
- Johnson Oil, Roseau Bulk Plant East (Site ID 17630)—Roseau, MN
  Limited Site Investigation
- Jeff's Super Service (Site ID 5837)—Greenbush, MN
  Additional Site Assessment, Groundwater Monitoring, Vapor Assessment, LIF Study, EDCAD Preporation
- Former Blossoms Flower & Gift Shop (Site ID 12866)—Hawley, MN
  Remedial Investigation
- Erickson Oil Company (Site ID 10564)—Fertile, MN
  Free Product Recovery
- Continental Western Group, Sikorski Residence Fuel Oil Spill (Site ID 18960)—Roseau, MN
  Vapor Assessment, Air Sampling, Reporting
- Johnson Oil, Roseau Bulk Plant West (Site ID 14568)—Roseau, MN
  Free Product Recovery, Groundwater Monitoring, Reporting
- Johnson Oil, Hallock Bulk Plant (Site ID 17629)—Hallock, MN
  Limited Site Investigation
- Northern Resources Cooperative, Nelson Residence Fuel Oil Spill (Site ID 19021)—Badger, MN
  Vapor Assessment, Water Well Assessment

Ty J. Fuglseth continued on the next page

Non-Petroleum Contamination Sites

- Former Seaforth Salvage (SA4064)—Seaforth, MN
  Phase II Investigation for Metals, PCBs, PAHs, Dioxins, VOCs, and Petroleum
- Bemidji Regional Events Center South Shore Site—Bemidji, MN
  Formaldehyde and Methane Testing
- Dan's Flying Service (MDA Case File No: CF-2692)—Crookston, MN
  Ag-Chem Phase I, Remedial Investigation, and Corrective Action for an Aerial Applicator Facility
- Agri-Max LLC—Crookston, MN, and Grafton, ND
  Ag-Chem Investigation
- Balzum Construction, Ag-Chem Phase II Investigation, Georgetown Farmers Elevator Site—Georgetown, MN
- Crookston Iron and Metal (Site ID VP20380)—Crookston, MN
  Phase I and Phase II Investigation for Metals, PCBs, and Petroleum Contamination
- Former Cedar Services—Bemidji, MN
  Soil & Groundwater Investigation of a Former PCP Wood Pole Treatment Facility

Phase I and Phase II Environmental Site Assessments (ESA)

- Minnesota Department of Transportation—Thief River Falls, MN
  Phase I & II ESA
- First State Bank of Grand Forks—East Grand Forks Tesoro
  Phase I ESA
- Bemidji Regional Events Center South Shore Site—Bemidji, MN
  Phase I ESA
- Border State Bank, Les's Sanitation—Thief River Falls, MN
  Phase I ESA
- Salem Motors—Crookston, MN
  Phase II ESA
- Valley Eldercare Center—Grand Forks, ND
  Phase I ESA
- Trinidad Benham Elevator & Former Asphalt Plant—Pillsbury, ND
  Phase I & II ESA

Other

- City of Bemidji Municipal Liquor Store—Bemidji, MN
  Asbestos and Hazardous Materials Inspection
- Douglas County DAC—Alexandria, MN
  Asbestos Inspection
- Benson Armory—Benson, MN
  Asbestos and Lead Paint Assessment
- Bemidji Regional Events Center—Bemidji, MN
  DEED Application Preparation for Contamination Investigation and RAP Preparation
- Mills Properties, Former Paul Bunyan Bowl—Brainerd, MN
  Asbestos and Hazardous Materials Inspection
- City of Starbuck-Old Starbuck Hospital—Starbuck, MN
  Asbestos and Hazardous Materials Inspection
- City of Crosby Wastewater Treatment Plant—Crosby, MN
  Asbestos and Hazardous Materials Inspection
- Rice County Bridges 88030, L2755, & 7320—Rice County, MN
  Asbestos and Regulated Waste Assessment
- Crow Wing County, Gull River Road Bridge L2845—Crow Wing County, MN
  Asbestos and Regulated Waste Assessment
- Pennington County Bridge 7248 —Pennington County, MN
  Asbestos and Regulated Waste Assessment

Tim E. Bayerl, PE — Engineer 4

Tim joined WSN in 1985 and has considerable experience in a wide range of civil engineering projects. He has been a project engineer responsible for planning, design, and construction supervision of numerous engineering projects. Tim manages WSN project teams assigned to the preparation of feasibility studies, preliminary and final plans and specifications, and construction observation. He monitors project budgets including administration of grant and loan monies. Tim has extensive experience in water resources engineering as well as municipal and industrial wastewater treatment. Previous experience as a water/wastewater treatment plant operator has been helpful in start-up and operator training for water and wastewater plants. Tim served as City Engineer for the City of Morris from 2000 to 2007. In 2008 Jeff Kuhn of WSN took over this position when Tim became Office Manager of WSN's Alexandria Office. Tim is currently City Engineer for the communities of Elrosa, Meire Grove and Wendell. Previous assignments as City Engineer include: Ashby, Brandon, Clarissa, De Graff, Greenwald, Henning, Herman, Osakis, Spring Hill, and Wheaton.

Licenses/Certifications

Professional Engineer: MN

Education

Bachelor of Science, Civil Engineering and Water Resources | University of Minnesota, 1981

RELATED PROJECTS

Landfill Projects

- Fifty Lake Demolition Landfill – Fifty Lakes, MN
  Design and Permitting
- Douglas County Demolition Landfill (SW-406)—Alexandria, MN
  Design and Permitting
- TK Demolition Landfill (SW-333)—Cold Spring, MN
  Design and Permitting
- Crow Wing County Landfill (SW-376)—Brainerd, MN
  Design, Permitting, and Closure
- Pope-Douglas Ash Landfill(SW-410) - Alexandria, MN
  Design and Permitting
- Becker County Landfill (SW-99) – Detroit Lakes, MN
  Design, Permitting, and Closure
- Todd County Demolition Landfill (SW-403)–Browerville, MN
  Design and Permitting
- Glenwood Demolition Landfill (SW-408) – Glenwood, MN
  Design and Permitting

Other

- Atlantic Avenue, Morris, MN
  Contaminated Soil Excavation – Utility Trenches
- TH 27, Herman, MN
  Contaminated Soil Excavation – Utility Trenches
- Wastewater System Improvements—Ashby, MN
- Wastewater System Improvements—Clarissa, MN
- Wastewater System Improvements— Lake Osakis, MN
- Wastewater System Improvements—Morris, MN
- Sanitary Sewer Collection Systems— Lake Mary Township, MN
- Sanitary Sewer Collection Systems—Ida Township, MN
- Sanitary Sewer Collection Systems—Ashby, MN
- Sanitary Sewer Collection Systems—Clarissa, MN
- Wastewater Stabilization Ponds— Wendell, Brandon, Clarissa, Henning, Morris, and Verndale, MN
- Constructed Wetland Wastewater Treatment—Spring Hill, MN
- Sanitary Sewer Collection Systems—Henning, MN
- Sanitary Sewer Collection Systems— Lake Osakis, MN
- Sanitary Sewer Collection Systems—Alexandria, MN
- Forada Wastewater Collection System/ Maple Lake Sanitary Sewer— Forada, MN
- GEM Wastewater System—Greenwald, Elrosa, Meire Grove, MN

Licenses/Certifications

40-Hour OSHA HAZWOPER Training

Erosion & Sediment Control

Education

BS, Resource, Recreation and Tourism | University of Idaho, 2006

AS, Wilderness Management | Vermillion Community College, 2004

Michael L. Bogart — Field Technician | Scientist 1 | On-Site Inspector

Mike joined WSN in January 2012. He has a varied background in wilderness management, natural resources, hazardous site clean-up, sampling, and inspections. His primary responsibilities as an environmental technician include soil/water field sampling, field data collection, and preparation of site drawings. Mike has experience with the collection of groundwater samples at numerous demolition landfills using low flow, dedicated and portable bladder pumps. While at WSN, Mike has worked closely with project managers in defining investigation and remediation solutions on various petroleum remediation projects and landfill investigations. Mike's other responsibilities include computerized data entry, remedial investigation report preparation, and developing remediation plans.

RELATED PROJECTS

Corrective Action Design Systems

- Captain Kirks Remediation Construction Observation Additional Work (Site ID 464)—Federal Dam, MN
- Hutto Residence Corrective Action (Site ID 17206)—Anoka, MN
- Johnson Oil, Dean & Greg's Corrective Action Design (Site ID 6736)—Wannaska, MN
- Johnson's Services Additional Investigation (Site ID 11617)—Motley, MN
- Lamia Ali Residence, Additional Investigation (Site ID 17116)—Moorhead, MN
- Sioux Oil Former Gas Station Corrective Action & Design (Site ID 5736)—Winger, MN

Petroleum Release Sites

- Angus Coop Elevator Limited Site Investigation (Site ID 16452)—Angus, MN
- Boondocks Groundwater Sampling & Vapor Checks (Site ID 17273)—Detroit Lakes, MN
- Gateway Super Service LSI and Vapor Assessment (Site ID 18412)—Kennedy, MN
- Circle R Ranch LSI (Site ID 17825)—Long Prairie, MN
- Continental Western Group Vapor Assessment (Site ID 18960)—Roseau, MN
- Dean & Greg's ASA (Site ID 6736)—Wannaska, MN
- Driftwood Family Resort RI (Site ID 17427)—Pine River, MN
- Hawley Bulk Site Monitoring and Corrective Action (Site ID 14404)—Hawley, MN
- Jeff's Super Service (Site ID 5837)—Greenbush, MN
- Johnson Oil, West Bulk Facility (Site ID 14568)—Roseau, MN
- Kens Amoco 2013 (Site ID 12613) Investigation—Chisholm, MN
- M&G Amoco - Hackensack Groundwater Quarterly Monitoring and Additional Investigation FY2013 (Site ID 12613)—Hackensack, MN
- Woodland Store 2012 Sampling (Site ID 9247)—Park Rapids, MN
- Former Pete's Garage LSI and Monitoring (Site ID 14494)—Ely, MN

Non-Petroleum Contamination Sites

- 2012 Wastewater Treatment Improvements—Nisswa, MN
- Arrowhead Cleaners Site Assessment (Site ID SA4392)—Grand Rapids, MN
- Biwabik 2013 Assessment—Biwabik, MN
- Brainerd Foundry Additional Investigation—Brainerd, MN
- Shoreline Soil Vapor Assessment (Site ID SA134)—Navarre, MN
- Former Cedar Services Wood Treatment—Bemidji, MN
- Methane Testing - Northland Arboretum—Brainerd, MN
- MnDOT TH7—Milan, MN
- MnDOT TH71—Jackson, MN
- Former Seaforth Salvage Limited Investigation (Site IDSA4064)—Seaforth, MN

Michael L. Bogart continued on the next page

Other

- Mahnomen Cty Demo Ground Water Sampling & Reporting—Mahnomen, MN
- TK Demo Landfill Groundwater Sampling and Annual Survey (SW-333)—Cold Spring, MN
- Todd County Demo Landfill Groundwater Sampling and Annual Survey (SW-403)—Browerville, MN
- Ambient Groundwater Quality Monitoring Network Installation for Northern and NE Minnesota
- Crow Wing County Landfill Services (SW-376)—Brainerd, MN
- Hengel Demo Landfill Sampling (SW-291)—Pillager, MN
- Industrial Park Road Basin Cleaning—Baxter, MN
- Omega Demo Monitoring Well Installation (SW-416) —St. Hilaire, MN
- Mahnomen County Demolition Landfill Groundwater Investigation (WS-377)—Mahnomen, MN
- Hengel Demolition Landfill (SW-291)—Pillager, MN
  Vinyl Chloride Groundwater Contamination Investigation
- Douglas County Demolition Landfill (SW-406)—Alexandria, MN
  Boron and Manganese Groundwater Contamination Investigation
- Capital Solutions Vapor and Soil Contamination Construction Observation—Grand Forks, ND
- Potlatch Monofill Sampling—Brainerd, MN

Licenses/Certifications

Professional Engineer: MN, WI

40-hour OSHA HAZWOPER Training

Erosion/Stormwater Management: Design Construction SWPPP

Registered SSTS Advanced Designer

Education

BS, Civil Engineering | North Dakota State University, 1990

David S. Reese, PE, VP — Engineer 3 | Project Manager

Dave has been with WSN since 1992. He provides engineering and planning assistance to clients regarding infrastructure needs and policy development. From feasibility studies through construction, his experience includes sewer, water, road, bridge, and environmental projects. Dave offers a strong background in addressing environmental issues. He has processed wetland fill permits for land development and utility and road construction for private developers, cities, and counties. He has prepared stormwater designs to mitigate runoff pollution and investigated the impact of pollutant releases to the soil and ground water including test drilling, sampling, data analysis, and report preparation.

RELATED PROJECTS

Corrective Action Design Systems

- Gulbranson Equipment (Site ID 15048)—Park Rapids, MN
  Water Line Replacement
- USFWS Wetland Management Office (Site ID 4802)—Detroit Lakes, MN
  Contaminated Soil Excavation

Petroleum Release Sites

- Jeff's Service (Site ID 5837)—Greenbush, MN
  Remedial Investigation
- DNR Forestry Office (Site ID 6464)—Park Rapids, MN
  Remedial Investigation
- Orton Oil, Tabaka Site (Site ID 6045)—Walker, MN
  Limited Site Assessment
- Aitkin Power Plant (Site ID 8566)—Aitkin, MN
  Remedial Investigation

Other

- CSAH 31 Groundwater Seepage Study—Pillager, MN
  Geotechnical Study
- Wilderness Resort—Pequot Lakes, MN
  Wastewater System Design
- Brainerd International Raceway Road Course and Stormwater—Brainerd, MN
  Permits, Plans, and Specifications
- Elbow Lake Airport—Elbow Lake, MN
  UST System Plans, Specifications
- 2007 Sanitary Sewer Project—Lakeshore, MN
  Permits, Plans, And Specifications
- Biosolids Treatment Study—Crosslake, MN
  Project Management, Design, Plans

Tim T. Ramerth, PE , VP— Engineer 3

Tim is a licensed engineer in Minnesota, he is a Vice President with the firm and has over 26 years of experience in the public and private sectors. He has been a project manager for over half of his career and has extensive experience in project development, project management, permitting, wetland regulation and environmental regulation. As a project manager, he has provided technical design and oversight of many projects from concept through bidding and final closeout. Tim's other responsibilities include municipal engineering, water resources, transportation, and private development. He frequently works with regulating agencies, local governments and state agencies to foster project support and acquire permit approvals for projects. He attends meetings with committees, residents and Councils to present materials and provide guidance and opinions.

Licenses/Certifications

Professional Engineer: ND, MN, WI

Design of Construction SWPPP; Construction Site Management

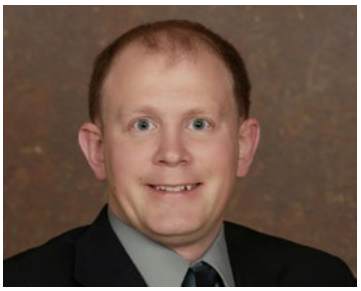
Education

Bachelor of Science, Agricultural Engineering | South Dakota State University, 1992

RELATED PROJECTS

Other

- Ossawinnamakee Channel Clean Out—Pequot Lakes, MN
- Big Lake Outlet Project—Big Lake, MN
- Bois de Sioux Watershed District Permit Application Reviews—Wheaton, MN
  General Watershed Engineering for Bois de Sioux
- General Watershed Engineering for Bois de Sioux Watershed District - Wheaton, MN
- Traverse County Ditch 52—Wheaton, MN
- Wilkin County Ditch 8—Doran, MN
- Wilkin County Ditch 10—Doran, MN
- Grant County Ditch 29—Herman, MN
- Traverse County Ditch 41—Dumont, MN
- Traverse County Ditch 52 Project Team—Wheaton, MN
- Bois de Sioux Watershed Flow Reduction Strategy— Wheaton, MN
- Two Rivers Watershed District Distributed Detention Plan—Hallock, MN
- Joe River Watershed District Distributed Detention Plan— Humboldt, MN
- Demolition Landfills
  - » Hengel Landfill— Hengel, MN
  - » Omega Landfill —Thief River Falls, MN
  - » Grinning Bear Landfill—Backus, MN
  - » Douglas County Landfill—Alexandria, MN
  - » Todd County Landfill—Browerville, MN
- Industrial Storm Water Permits
  - » Brainerd Industrial Center—Brainerd, MN
  - » Hawkes Peat Mining—Marshall County, MN
- NPDES Construction Oversight
  - » MN TH 11— Loman to Pollard, MN
  - » MN TH 2— Bena, MN
  - » MN TH 371— Nisswa to Jenkins, MN
- CATEX
  - » MN TH 23 — Pipestone, MN
  - » MN TH 67— Redwood Falls, MN



Nicholas G. Koos, PE — Engineer 2

Nick Koos joined WSN as a full-time employee in 2006 after having spent five summers working for the firm, performing construction inspection and civil engineering tasks. Since that time, he has assumed greater project responsibilities as well as furthered his career by becoming a licensed professional engineer. Nick is responsible for assisting the project engineer with feasibility studies, street improvements, water and sewer design, site planning and residential development, stormwater pollution prevention plans, wastewater facilities plans, and hydraulic design.

Licenses/Certifications

Professional Engineer: MN

Erosion/Stormwater Management: Design Construction SWPPP; Construction Site Management

MnDOT Certifications: Aggregate Production, Bituminous Street Level II, Concrete Field Level II, Grading & Base Level I

Education

BS, Civil Engineering | North Dakota State University, 2005

RELATED PROJECTS

Corrective Action Design Systems

- Meyer Residence (Site ID 13565)—Easton, MN
  Corrective Action Alternative Analysis

Other

- Wastewater Treatment Facility Upgrade—International Falls, MN
  Plans and Specifications
- Phosphorus Removal Improvements—Starbuck, MN
  Design and Plans
- Southwest Drainage Airport Detention Pond—Alexandria, MN
  Design, Permits, Plan
- Wastewater Stabilization Pond—Hancock, MN
  Design, Plans, and Specifications
- Wendell Water System—Wendell, MN
  Plans and Specifications
- Hospital Demolition Retrieval Investigation—Starbuck, MN
  Environmental Assessment, Plans, and Specifications
- Industrial Stormwater Permit, Morris Sand and Gravel—Morris, MN
  Permit and Plan
- Wastewater Collection System—Forada, MN
  Plans and Construction Observation
- Wilton Overpass Design-Build—Bemidji, MN
  Erosion Control Plans, SWPPP
- Sunopta Monitoring for SWPPP—Alexandria, MN
  Sampling, Permits and Design

Education

Diploma, Computer Aided Design Technologies | Hoosier Hills Area Vocational School, 1995

Joshua W. Rebennack — GIS/CADD Specialist

Joshua joined WSN in 2012. He is primarily responsible for preparing figures for reports and drawings, and is the primary GIS/CADD Specialist for creating the Site Investigations / Limited Site Investigations, Corrective Action Design / Excavation Detailed Corrective Action Design plans, and Environmental Assessment Worksheets figures. Joshua also created plans for nearly a dozen demolition landfill re-permitting applications. He has experience with drafting, design and layout of proposed developments, as well as converting and integrating GIS data. Joshua is experienced with Civil 3D and ArcGIS software for drafting and mapping of relevant features of a site and assists others with GIS mapping and data handling.

RELATED PROJECTS

Phase I and Phase II Environmental Site Assessments

- Hallock Cenex Phase II, Johnson Oil—Hallock, MN
- Houston Ford Phase I ESA—Pine River, MN
- MNDOT Phase I and II ESAs of TH 71 Bridge Corridor—Jackson, MN
- MnDOT & City of Kelliher Phase I and II ESAs of TH72—Kelliher, MN
- Holiday Stores Phase II Assessments—Deerwood, Aitkin, McGregor, MN
- 2012 Facility Review, Lowe's—Cambridge, MN
- 2012 Facility Review, Lively Annex—Baxter, MN
- 2012 Facility Review - Mills Fleet Farm—Carver, MN
- 2012 Facility Review -Mills Parts Center—Willmar, MN
- Willmar Chrysler, Environmental ESA & Phase II—Willmar, MN
- Crosby Cardiovascular Clinic/Cuyuna/Allina—Baxter, MN
- Fair Oaks Lodge Phase II ESA—Wadena, MN
- Fond du Lac Bowling Alley Phase I ESA, Including Asbestos—Fond du Lac, WI
- Frandsen - Clow Stamping Phase I ESA—Merrifield, MN
- Hebert Holdings-Argyle Phase I ESA—Argyle, MN
- Isle Drive Phase I ESA—Baxter, MN

Petroleum Release Sites

- Former Shamrock Café LSI Investigation (Leak Site 19557)—McGregor, MN
- Maple Street Project LSI & ASA (Leak Site 19702)—Aldrich, MN
- Ribaudo Residence LSI (Leak Site 19622)—Culver, MN
- City of Argyle Utility Project LSI (Leak Site 18165) —Argyle, MN
- Circle R Ranch LSI (Leak Site 17825)—Long Prairie, MN
- Clarkfield LSI Investigation (Leak Site16212)—Clarkfield, MN
- Eagle Bend Oil 2013 Investigation (Leak Site 13022)—Eagle Bend, MN
- Former Blossoms ASA (Leak Site 12866)—Hawley, MN
- Former Gas Station (Leak Site 13869)—Ada, MN
- Johnson Oil, East Bulk Facility (Leak Site 17630)—Roseau, MN
- Johnson Oil, Hallock Bulk Facility (Leak Site 17629)—Hallock, MN
- Johnson Oil, West Bulk Facility (Leak Site 14568)—Roseau, MN
- Kens Amoco 2012 Investigation (Leak Site 12613) —Chisholm, MN

Corrective Action Design Systems

- Dean & Greg's ASA (Leak Site 6736)—Wannaska, MN
- Hutto Residence Corrective Action (Leak Site 17206)—Anoka, MN
- Jeff's Super Service (Leak Site 5837)—Greenbush, MN
- Johnson Oil, Dean & Greg's CA Design (Leak Site 6736)—Wannaska, MN

Joshua W. Rebennack continued on the next page

- Johnson's Services Additional Work—Motley, MN
- Kirks CADesign (Leak Site 464)—Federal Dam, MN

Other

- 2016 Alex Rubbish Groundwater Sampling and Annual Survey—Alexandria, MN
- 2017 Alex Rubbish Groundwater Sampling and Annual Survey—Alexandria, MN
- 2017 Glenwood Landfill Permitting—Cold Spring, MN
- 2017 Grinning Bear Demo Landfill Groundwater Sampling and Annual Survey—Pine River, MN
- 2017 Lakes Area Demo Landfill Groundwater Sampling and Annual Survey—Detroit Lakes, MN
- City of Wendell Water System—Wendell, MN
- DeGraff Wastewater System Improvements Study—DeGraff, MN
- Hengel Demo Landfill 2017 Sampling—Pillager, MN

Education

BS, Industrial Technology/ Construction Management
Moorhead State University, 1984

AS, Architectural Commercial Design | Wisconsin Indianhead Technical College, 1994

Coursework, Architecture | North Dakota State University, 1979–1980

Christopher J. Satterlund — CADD Specialist

Chris joined WSN in 1994 and is responsible for architectural and site drawings for remodel and new construction of large municipal, institutional, and commercial facilities (e.g., retail, vehicle maintenance, manufacturing). He is responsible for verifying conditions, design, drafting, estimating, construction administration, construction inspection, and staking. Prior to WSN, Chris worked for a general contractor for 10 years as a quality assurance supervisor, superintendent, and estimator with primary responsibility for construction management, job survey and layout, estimating, and technical report writing. He has experience working on projects including wastewater treatment plants, oil refineries, power plants, dams, churches, and schools.

RELATED PROJECTS

Corrective Action Design Systems

- Dillon Residence (Site ID 15589)—Paynesville, MN
  Corrective Action Design
- Lamia Ali Residence (Site ID 17116)—Moorhead, MN
  Corrective Action Design
- Hutto Residence CAD Implementation (Site ID 17206)—Anoka, MN
  Corrective Action Design
- LaFave Radon System (Site ID 16755)—St. Paul, MN
  Corrective Action Design

Other

- Landfill Assistance—Marshall, MN
  Design and Plans
- Mills Ford Remodel—Brainerd, MN
  Design and Plans
- Mills Fleet Farm Remodel—Baxter, MN
  Plans and Design
- Sioux Falls Landfill Valve House—Sioux Falls, SD
  Building Design and Plans
- Materials and Salt Storage Facility—Nisswa, MN
  Feasibility, Plans, and Design
- Mille Lacs Academy New Campus—Onamia, MN
  Design and Plans
- Mills Fleet Farm New Store—Carver, MN
  Plans and Design
- Slope Stabilization Repairs—Rochester, MN
  Design and Plans

Carrie E. Freeman — Scientist 1 | Field Technician | GIS Specialist

Carrie joined WSN in 2018 working alongside the environmental department as the firm's first water quality scientist. She has experience in data management for numerous environmental assessment and remediation projects in Minnesota and the Midwest, including data comparison to regulatory criteria and quality assurance of analytical data. Carrie is responsible for expanding our environmental services to include stream and lake water quality modeling, surface water planning, and coordination of stormwater/surface water sampling. She is also an internal resource for other WSN staff with water quality questions and will augment WSN's water sampling capabilities for field work and laboratory analysis.

Education

MS, Water Resources Science | University of Minnesota Duluth, 2016

BS, Environmental Science | Minnesota State University Mankato, 2012

Geographic Information Systems (GIS) Certificate | Minnesota State University Mankato, 2012

RELATED PROJECTS

Other

- Lake Malawi physical limnology observations and modeling—Lake Malawi, Africa
- Impervious Surface Assessment on Madison Lake— Madison Lake, MN
- Lake Andrew EAW — Alexandria, MN
- Greater Blue Earth River Basin Alliance Water Quality Modeling, GIS — Mankato, MN
- Minnesota Pollution Control Agency (MPCA) Watershed Pollutant Load Monitoring Network Sampling—Central Minnesota
- Hawkes Peat Mining Operations, Permitting Assistance—Newfolden, MN

Licenses/Certifications

24-Hour OSHA Hazardous Waste Site Worker Training

Charles M. Nelson — CADD Specialist | Field Technician

Chuck joined WSN in 1978 and has gained extensive experience performing many land corner restoration projects across Minnesota. His experience in both field observations and office calculations has allowed him to provide private and public clients accurate, thorough, and efficient results. He routinely performs historical research/preparation for projects, assists in corner recovery, searches, and monumentation. He is trained in the use of Trimble S6 robotic total stations, Trimble static and RTK GPS systems, data collection and AutoCAD. He has worked on several remonumentation projects with MnDOT, Corps of Engineers, Farmers Home Administration, and the US Forest Service. Chuck is responsible for using AutoCAD Civil 3D to draft land survey certificates, legal descriptions, FEMA Elevation Forms, right-of-ways, and subdivision plats.

RELATED PROJECTS

Other

- MnDOT
- U.S. Army Corps of Engineers
- Farmers Home Administration Wetland Surveys
- U.S. Forest Service Cross-Section Elevations
- Fort Ripley, Hartman Boundary Survey—Crow Wing County, MN
- Living Word Christian Center—Crow Wing County, MN
  Boundary Survey
- Wadena Airport—Wadena, MN
  Boundary Survey
- Lake of the Woods County, MN
  Section Subdivision and Survey Boundary
- TH 78—Ottertail County, MN
  Control Survey
- CSAH 4—Cass County, MN
  Preliminary Survey for Roadway Reconstruction
- City of Baxter, MN
  Right-of-Way Plats, Subdivision Plats, Road Construction Easements, and Boundary Surveys
- Crow Wing County Landfill—Brainerd, MN
  Survey Boundary and Topography
- Former Burlington Northern Tie Plant—Baxter, MN
  Topography of Site and Monitoring Well Elevations
- Pine River Wood Products—Pine River, MN
  Topography of Contaminated Site
- City of Crosslake, MN
  Sanitary Sewer Easements and Construction Staking
- CSAH 20—Crow Wing County, MN
  Road Right-of-Way Determination and Legal Descriptions

Paul A. Strong, EIT — Engineer 1

Paul joined WSN in 2016 after completing a master's degree in civil and environmental engineering. He has experience working in Illinois and California on hydrological studies, stormwater pollution prevention, environmental impact studies, effluent and waste assessments, and wetland delineations. As an environmental engineer, Paul is primarily responsible for hydrologic modeling, environmental reporting, and pollution control and countermeasure plans. He also assists the environmental department with wetland delineations.

Licenses/Certifications

NCEES Engineer in Training

40-Hour OSHA HAZWOPER Training

Education

MS Environmental Engineering | University of California, Los Angeles, 2015

BS, Natural Resources & Environmental Science | University of Illinois Urbana-Champaign, 2014

RELATED PROJECTS

Other

- Water Supply Plan—Pine Island, MN
- Water Supply Plan—Baxter, MN
- Wellhead Protection Plan—Isle, MN
- Wellhead Protection Plan—Pine Island, MN
- Phase I Environmental Site Assessment
  - » Baudette, MN
  - » Minneapolis, MN
  - » Rochester, MN
  - » Deerwood, MN
  - » Kelliher, MN
  - » Monticello, MN
- Phase II Environmental Site Assessment
  - » Nisswa, MN
  - » Owatonna, MN
- Petrofund Application—Herman, MN
- Spill Response Plan—Glenwood, MN
- Spill Prevention Control & Countermeasure Plan
  - » Hermantown, MN
- TH 200 Wetland Delineation—Walker, MN
- Stormwater Pollution Prevention Plan
  - » Brainerd, MN
  - » Baxter, MN
- Facility Assessment—Deerwood, MN

Licenses/Certifications

Wetland Delineation Certified

Education

BS, Natural Resource Management | North Dakota State University, 2013

Joey M. Goeden — Scientist 1 | Field Technician

Joey Goeden graduated from North Dakota State University in 2013 with a B.S. in Natural Resources Management. He has more than three years' experience in wetland delineation and wetland permitting at WSN. He is a certified wetland delineator in the State of Minnesota.

His responsibilities at WSN include Wetland Delineations, Wetland Permitting, Wetland Monitoring, Phase I Environmental Site Assessments and Watershed Monitoring. He has worked on delineation projects that have ranged in size from less than five acres to several hundred acres. The projects have included most of Minnesota's wetland and vegetation types, as well as agricultural lands and atypical situations. He is experienced in GPS equipment and techniques. He has experience writing environmental documents such as Wetland Delineation Reports, Wetland Monitoring Reports, Phase I Environmental Site Assessments, Environmental Assessments and Environmental Impact Statements.

RELATED PROJECTS

Phase I Environmental Site Assessments

- Lakes Region EMS – Lindstrom, MN
  Phase I ESA
- Essentia Heath Clinic – Pequot Lakes, MN
  Phase I ESA
- Essentia Health Clinic – Crosslake, MN
  Phase I ESA
- Mills Fleet Farm – Lakeville, MN
  Phase I ESA
- Mills Fleet Farm – Owatonna, MN
  Phase I ESA
- Mills Fleet Farm – Monticello, MN
  Phase I ESA
- The Bodyworks Super Collision Center – Baxter, MN
  Phase I ESA

Other

- MPCA Watershed Pollutant Load Monitoring Network – Central MN
  Primary Sampler
- Northdale Oil, Inc. – Bemidji, MN
  Environmental Evaluation Checklist (FSA-850)
- Northdale Oil, Inc. – Drayton, ND
  Environmental Evaluation Checklist (FSA-850)
- Excelsior Road Improvements – Baxter, MN
  Soil Borings for Stormwater Pond Design
- MnDOT TH 200 – Cass County, MN
  Wetland Delineation and Report
- Placid Drive Improvements – Crow Wing County, MN
  Wetland Delineation and Permitting / Endangered Species Permit

Licenses/Certifications

Engineer-in-Training: Minnesota

MnDOT Certification:
- Bituminous Street Level I & II
- Grading & Base Level I
- Aggregate Production

MN Erosion/Sediment Control Specialist: Design Construction SWPPP

Education

BS, Civil Engineering | University of Minnesota Duluth, 2013

Tony A. Pohl, EIT — Engineer 1

Tony joined WSN in early 2014 with five years of experience in construction. He has expanded his experience to include design for public and private engineering projects including roadways, storm water management systems, and lot development plans. He conducts field inspections, interprets design criteria, develops and reviews site plans and designs, develops special provisions for construction, and coordinates plans and designs with clients. He is responsible for design drafting of an array of civil engineering projects, including new subdivisions, lot and building layouts, water and sewer systems, wastewater treatment systems, storm sewers, and street and highway improvements.

RELATED PROJECTS

Other

- Clark Drive Water Extension—Verndale, MN
- Edgewood Drive Storm Study—Baxter, MN
- Sewer Improvements - Rural Development—Verndale, MN
- Drainage Improvements—Lake Shore, MN
- Malone Island Bridge Design (SAP 048-597-003)—Isle, MN
- Mills Fleet Farm—Monticello, MN
- Inglewood Drive Improvements (SAP 230-107-002)—Baxter, MN
- Pequot Lakes Wastewater Treatment Facility Plan—Pequot Lakes, MN
- Evergreen Court Extension, District III—Hinckley, MN
- Crosby–Ironton High School Track and Field Design—Crosby, MN
- Fosston SuperValu—Fosston, MN
- Nystrom Associates Clinic—Baxter, MN
- River Oaks Dental—Aitkin, MN
- Milford Mine Memorial Park—Crosby, MN
- Dellwood Drive and Novotny Road Improvements (SAP 230-116-001)—Baxter, MN

Key Staff Matrix

Name Lic./Certification Classification	Location	OSHA 40-Hr w/8-Hr Yrly Refreshers	OSHA 24-Hour Training	OSHA 8-Hour Supervisor Training	Certified Asbestos Inspector	Certified Lead Risk Assessor	Lic. Monitoring Well Contractor	SWPPP Training and Certification	Years Experience—WSN	Years Experience—Total	Highest Degree Earned	Discipline	Petroleum Release Sites	Non-Petrol Contamination Sites	Ph I & Ph II Environ Site Assess	Corrective Action Dsgn Systems	Other Environ/Engr Projects
Brian Ross, PG PM, S2	BRD	■	■	■			■	■	27	33	MS	Geology	■	■	■	■	■
Mark Hallan, PE E4	BRD								17	34	BS	Civil Engr	■			■	■
Greg Smith, PG PM / S2	BRD	■	■						28	30	BS	Geological Engr	■	■	■	■	■
Ty Fuglseth, PG PM / S2	CKN	■	■		■	■			23	25	MS	Geology	■	■	■	■	■
Tim Bayerl, PE E4	AXN							■	32	36	MS	Civil Engr	■	■		■	■
Mike Bogart FT, S1, OSI	BRD	■	■					■	6	8	BS	Res, Rec & Tourism	■	■	■	■	■
Dave Reese, PE E3	BRD	■	■					■	26	28	BS	Civil Engr	■	■	■	■	■
Tim Ramerth, PE E3	BRD							■	15	15	BS	Civil Engr			■		■
Nick Koos, PE E2	AXN	■	■					■	12	12	BS	Civil Engr				■	■
Joshua Rebennack CS	BRD								6	23	AA	CADD	■	■	■	■	■
Carrie Freeman S1, FT	BRD								.5	3	MS	Water Quality Science			■		■
Chuck Nelson CS, FT	BRD		■						40	43	HS	CADD, Land Surveying	■	■	■	■	■
Paul Strong E1	BRD	■							1	3	MS	Environmental Engr	■	■	■		■
Joey Goeden S1, FT	BRD								4	5	BS	Environmental Science					■
Tony Pohl E1	BRD							■	4	5	BS	Civil Engr					■

PM Project Manager
S1 Scientist 1
S2 Scientist 2

E1 Engineer 1
E2 Engineer 2
E3 Engineer 3

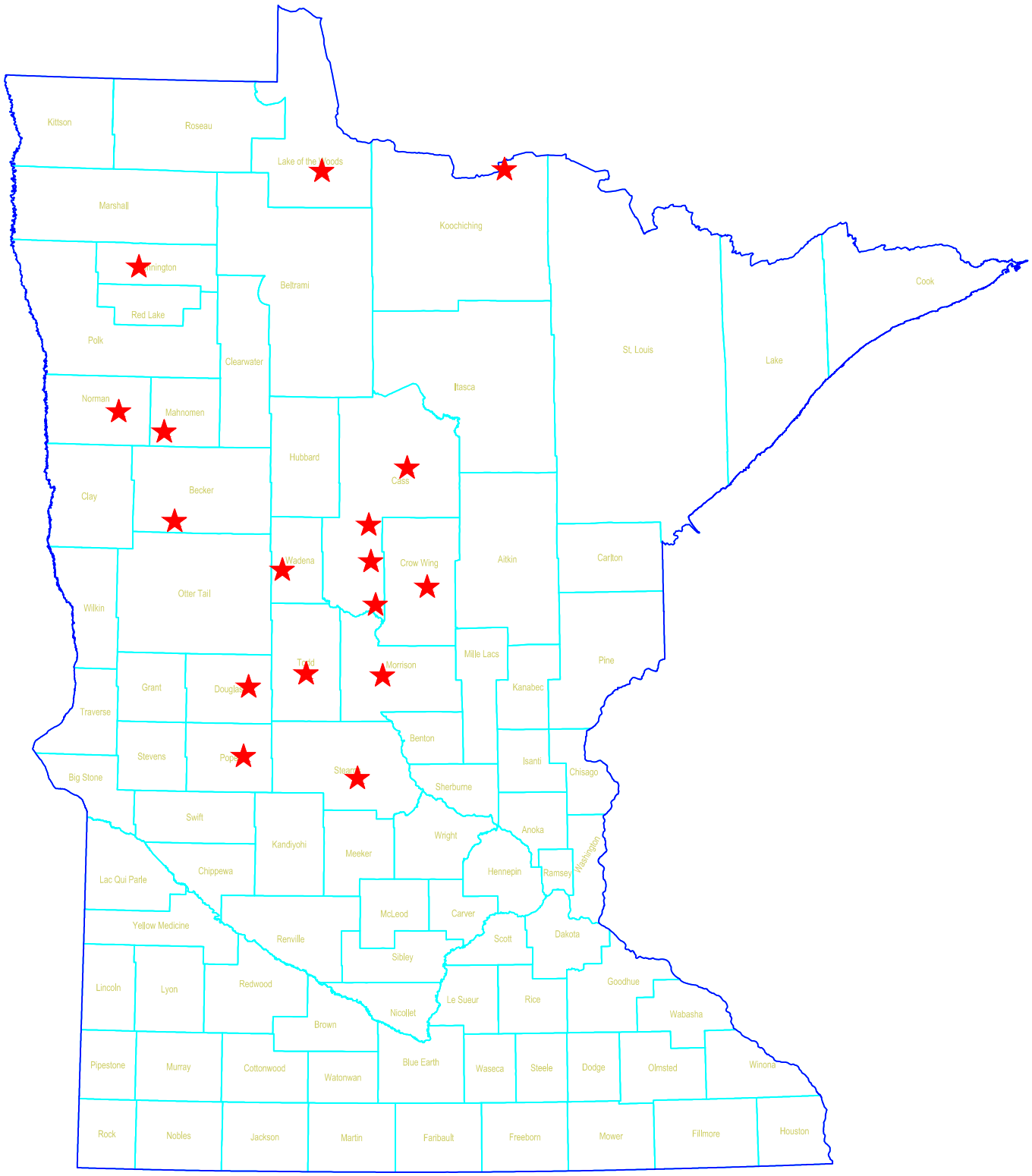
E4 Engineer 4
FT Field Technician
OSI On-Site Inspector

CS GIS/CADD Specialist

AXN Alexandria
BRD Brainerd/Baxter
CKN Crookston

Landfill Groundwater Monitoring Systems and Remedial Investigations

WSN has completed within the past five years-or has underway- groundwater monitoring systems and remedial investigations at 17 landfills.



WSN's Experience

Other Federal and State Agency Experience

WSN has had significant contractual experience with several federal agencies including USDA Rural Development, USDA Forest Service, Region 9 (Architectural), U.S. Army Corps of Engineers (Surveying and Civil Engineering), U.S. Air Force (Architectural, Mechanical, and Electrical Engineering at Grand Forks and Minot Air Force Bases), and the U.S. Fish and Wildlife Service (Contamination Investigation at Wildlife Refuges and Waterfowl Production Areas Offices). In addition to our current Professional/Technical Master Contract with the MPCA, WSN is also currently pre-qualified in Contamination Investigation Level 1 and Environmental Documentation Level 2 and 3 for MnDOT and has previously been a pre-approved Contamination Investigation and Environmental Site Assessment contractor for the Minnesota Department of Natural Resources.

Knowledge of MERLA, Land Recycling Act, RCRA, CERCLA, National Oil and Hazardous Substances Contingency Plan (NCP)

WSN has completed numerous environmental projects over the last two years that have fallen under the jurisdiction of CERCLA, MERLA, RCRA, and other state and federal regulations. WSN regularly refers to Minnesota Statute 115B (MERLA), Minnesota Statute 115C (VIC), and 40 CFR Part 307 when working on projects involving hazardous materials. We deal with sampling and analyzing RCRA hazardous wastes several times a year. Many of WSN's staff maintain 40-hour HAZWOPER certifications and consistently attend trainings and seminars hosted by the MPCA. We regularly refer to Minnesota Rule 7035 for our municipal and demolition landfill work, with particular focus on MR 7035.2565 and 7035.2825 for the annual monitoring reports. On projects where underground storage tank removal is being done we adhere to Minnesota State Fire Code Sections 5704.2.13 and 5704.2.14, and Minnesota Rule 7150. For Petrofund projects we adhere to the standards detailed in Minnesota Rule 2890 and Minnesota Statute 115C. WSN has completed or updated twenty-five Spill Prevention Control and Countermeasure Plans, giving us ample experience with both the NCP, the Clean Water Act, and 40 CFR Part 112. WSN has completed 10 asbestos inspections in the last two years, all of which were conducted in accordance with Minnesota Statutes 326.70 to 326.81, with the recommended abatement activities being compliant with Minnesota Rules 4620.3000 to 4620.3724.

3. Project Descriptions

Douglas County Demolition Landfill Remedial Investigation

Alexandria, Minnesota

Site Description

Douglas County Demolition Landfill (facility) is located at 2967 Pike Lane Northeast, approximately 3.5 miles north of Alexandria, Minnesota. The facility was originally authorized as a Permit-By-Rule demolition debris facility in 1990. The permitted landfill operations occupy approximately 14 acres of a larger 21-acre parcel. The facility is operated as a Class I Demolition Landfill and is surrounded by rural residential and agricultural use property. The groundwater monitoring system consists of six monitoring wells. One monitoring well is located up gradient of the in-place demolition debris and the five remaining monitoring wells are located down gradient of the landfill. There are two well nests on the facility property, each consisting of two wells. Data collected during annual sample collection of the facility's groundwater monitoring system, indicate groundwater contamination has been identified at concentrations that exceed the applicable Minnesota Department of Health (MDH) standards for boron, manganese, and vinyl chloride. Groundwater flow at the facility is to the west with a slight southerly flow component toward Krueger's Slough located about 500 feet to the west.

Project Description

Widseth Smith Nolting (WSN) was retained by Douglas County Demolition Landfill to perform a groundwater investigation to define the extent of arsenic, boron, and vinyl chloride in the groundwater downgradient of the facility. A work plan detailing the goals and methods of the groundwater investigation was submitted to the client and the Minnesota Pollution Control Agency (MPCA) for approval. As outlined in the work plan, discrete groundwater samples were collected from push probes starting at the groundwater interface and every 10 feet thereafter to depths between 50 and 60 feet. To adequately define the extent of the contaminants, it was necessary to conduct three separate investigative phases. During each phase, samples were collected and analyzed by a certified laboratory. The analytical results were reviewed by WSN staff to determine the next step in defining the extent of the groundwater contamination. At the end of each phase, a short report was prepared including an

Client

Douglas County Demo & Landfill, LLC

Contact:
Ricky Kluver
320.808.7292

analytical results summary table, a probe location map, and a cross section map. The cross sections documented the depth of each discrete sample and the sample's analytical results. The results from each phase were reported to the assigned MPCA hydrogeologist along with a subsequent work plan detailing the next steps required to complete the next phase of the investigation.

Phase I of the investigation consisted of completing five push probes to a depth of 50 feet. The probes were positioned along the west property boundary to further assess the groundwater contamination reported from the previous year's annual monitoring events. In each probe, discrete groundwater samples were collected starting at the groundwater interface and continued every 10 feet until the terminus of the boring at 50 feet. Geoprobe technology was used to collect the discrete groundwater samples using a four-foot long, one-inch outside diameter mill-slotted sampling screen and disposable tubing equipped with a check ball. Twenty-four discrete groundwater samples were collected and analyzed during Phase I. Results of Phase I showed detections of boron and vinyl chloride in samples collected from depths of 50 feet.

Phase II was initiated and consisted of six push probes located approximately 100 feet west of the facility's west property boundary. Discrete groundwater samples were again collected in all six borings. A discrete groundwater sample was collected from the groundwater interface and every 10 feet to an approximate depth of 50 to 60 feet. As part of the Phase II investigation, 36 discrete groundwater samples were collected by WSN staff and sent to the laboratory for analysis. Results of Phase II showed the horizontal and vertical extents of the groundwater contamination had not yet been defined.

Phase III of the groundwater investigation included the installation of nested monitoring wells to assess if an upward vertical gradient is present beneath the facility. This was necessary because if an upward vertical gradient did exist and it can be proven the groundwater near the facility is discharging to the surface water downgradient, or west of the landfill, surface water standards may be used when referring to applicable health standards for the specific groundwater contaminants. To complete the nested monitoring wells, three additional monitoring wells were installed. The deep monitoring wells were constructed using 5-foot screens. One additional shallow well was installed as a water table well with a 10-foot screen. Only one shallow monitoring well was needed because we were able to use an existing monitoring well for the second set of nested monitoring wells. The locations and top of casing elevations for the new wells were surveyed using GPS technology.

Tasks Performed	Personel Involved
Coordinated and obtained access agreements for the advancement of the soil probes	Mike Bogart (FT) Greg Smith (PM)
Collaborate with the client and MPCA hydrogeologist to define scope of work and objectives	Greg Smith (PM)
Request bids for drilling services and make recommendations to client	Greg Smith (PM)
Performed drilling oversight and groundwater collection	Mike Bogart (FT)
Collected data from each phase and submitted to client and MPCA	Mike Bogart (FT) Greg Smith (PM)
Prepared data tables and associated figures depicting location of sampling points and associated results	Mike Bogart (FT) Joshua Rebennack (CT) Greg Smith (PM)

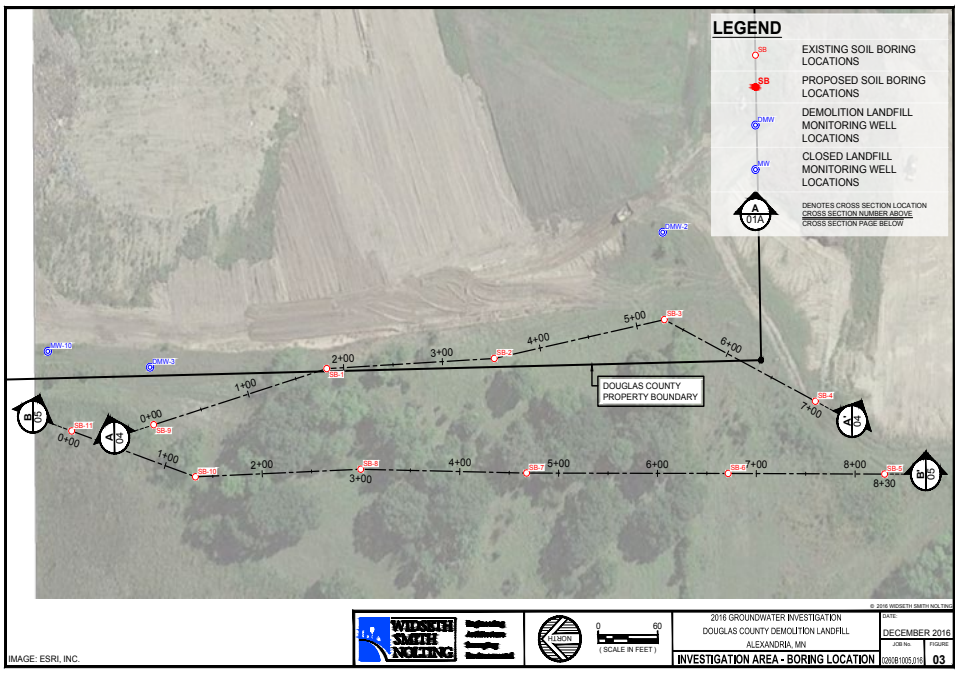
Subcontracted Tasks

The following tasks were subcontracted out.

- Push probe advancement
- Installation of monitoring wells
- Laboratory analyses of all groundwater samples

Outcome Achieved

The collection of the soil and groundwater data allowed to determine the extent and magnitude of the contaminant plume. Concentrations of boron, arsenic, and vinyl chloride above the MDH standards are present in the groundwater downgradient of the facility. The potential for the contaminated groundwater to affect human health and the environment exists. Two sets of nested monitoring wells were installed to assess if an upward, hydraulic gradient is present beneath the facility. If an upward gradient exists and it can be shown the groundwater from beneath the facility discharges to Kreuger's Slough, we were advised by MPCA staff that surface water standards may be referenced in lieu of the established groundwater standards. Because the MPCA's assigned hydrogeologist retired in December 2017, and a replacement has not been assigned, a corrective action for the facility has not been defined.



Hengel Demolition Landfill Remedial Investigation

Pillager, Minnesota

Site Description

The Hengel Demolition Debris Landfill (facility) is located just east of Pillager, Minnesota on the north side of State Highway 210. The landfill operations occupy approximately 27.5 acres of a 120-acre parcel. The facility is operated as a Class I Demolition Landfill and was first permitted in 1985. The area surrounding the facility consists of rural residential development to the north, west, and southwest. The residential properties are serviced by private domestic water wells. To the south and southeast of the facility is some light industrial development and agricultural land.

The groundwater monitoring system for the facility consists of two piezometers and seven monitoring wells. Two monitoring wells are located up gradient of the facility and five monitoring wells are in the down gradient direction. Data collected from annual sampling of the environmental monitoring system shows the groundwater contamination is present at levels that exceed the applicable health standards for boron, manganese, and vinyl chloride. Groundwater flow beneath the facility is to the southwest.

Project Description

Widseth Smith Nolting (WSN) was retained by Hengel Demolition Debris Landfill to conduct a groundwater investigation to define the extent of boron, manganese, and vinyl chloride in the groundwater both upgradient and downgradient of the facility. To adequately conduct the investigation, it was necessary to execute three separate phases of the investigation. After each phase, samples were collected and submitted under standard chain of custody procedures to a certified laboratory for analyses. The results were reviewed by WSN staff to determine the next step to further define the vertical and horizontal extents of the groundwater contamination. At the end of each phase, a table was prepared showing the analytical results from each probe. A probe location map and cross section map were completed documenting the depth and location of each probe, the depths of each discrete groundwater sample, and the analytical results. The results from each phase were reported to the assigned MPCA hydrogeologist and a new work plan was submitted detailing the goals and the next steps required to complete the investigation.

Client

Hengel Demolition Landfill

Contact:
Heather Schmit
218.746.3355

Phase I of the investigation included nine soil borings to depths of 60 to 100 feet. Three soil borings were completed up gradient of the facility to assess site conditions and six soil borings were positioned downgradient of the in-place debris to assess the extent and magnitude of groundwater contamination reported from historical annual sampling events. From each soil boring, discrete groundwater samples were collected starting at the groundwater interface and every 10 feet thereafter, until the terminus of the probe, which varied from between depths of 60 to 100 feet. Geoprobe technology was used to collect the discrete groundwater samples using a four-foot long, one-inch outside diameter mill-slotted sampling screen and disposable tubing equipped with a check ball. A total of 60 discrete groundwater samples were collected and analyzed during the completion of Phase I. The results for Phase I showed detections of boron, manganese, and vinyl chloride to a depth of at least 100 feet in the samples collected from downgradient soil borings. Results from the three upgradient soil borings showed manganese occurs naturally at concentrations exceeding the Minnesota Department of Health (MDH) standards

Consequently, Phase II was initiated and consisted of one soil boring located up gradient and seven soil borings downgradient of the in-place debris. Discrete groundwater samples were again collected from all seven soil borings. Beginning at the maximum depth obtained using probe technology, a discrete groundwater sample was collected at the base of the probe and every 10 feet until the groundwater interface. As part of the Phase II investigation, 76 discrete groundwater samples were collected and submitted to the laboratory for analyses. In addition to the soil boring sampling of Phase II, property owners were contacted both up-gradient and downgradient of the facility. Water samples were collected from 17domestic water wells. Two domestic water well samples were collected from up-gradient wells to verify manganese is naturally occurring above the health risk limit of 100 parts per billion. Fifteen domestic water wells were sampled downgradient of the facility and analyzed for boron, manganese, and vinyl chloride. Results of Phase II of the investigation showed the horizontal and vertical extent of groundwater contamination had not yet been defined. Results from the sampling and analyses of 15 domestic wells downgradient of the facility did not show vinyl chloride or boron detections above their respective intervention limits.

Phase III of the groundwater investigation included the advancement of an additional nine soil borings. One soil boring was completed on the facility property. The additional eight soil borings were completed off the facility property to the south and southwest to further define the vertical and horizontal contamination. Discrete groundwater samples were collected from each boring from a depth of approximately 100 feet and every ten feet until the groundwater interface. Phase III of the investigation included an additional 80 discrete groundwater samples sent to the laboratory for analyses. The Phase III results show the vertical and horizontal extents of the contamination had been defined. The outcome of the investigation has showed that groundwater contamination is present beneath the facility and beyond the compliance boundary.

Although the results of the groundwater investigation suggest the groundwater contamination does not appear to have migrated beyond the property boundaries, the need to address the contamination plume cannot be over looked. WSN is working with the facility to prepare a corrective action plan to address the impacted groundwater. Two major objectives have been identified. First, changes in facility operational procedures (best management practices) must be made. This will be completed by working with the landfill owner and operator to better minimize their working face and to install a better, less permeable final cover to stop the leaching of potential overland storm water run-off through the demolition debris. Second, the contaminated groundwater needs to be remediated. To accomplish this a groundwater aquifer test will be initiated to better understand the current conditions beneath the facility. Also, using the data collected from the groundwater aquifer test, gradient control wells will be installed at the facility site to extract and strip the vinyl chloride from the impacted groundwater. The groundwater monitoring system will also be expanded to better monitor the migration or movement of the impacted groundwater. Nested monitoring wells will need to be installed downgradient of the

contamination plume and monitored to ensure the contaminated groundwater does not travel beyond the facility boundaries.

Tasks Performed	Personel Involved
Coordinated and obtained access agreements for the advancement of soil probes	Mike Bogart (FT) Greg Smith (PM)
Collaborate with client and MPCA hydrogeologist to define scope of work and objectives	Greg Smith (PM)
Request bids for drilling services and make recommendations to client	Greg Smith (PM)
Performed drilling oversight and groundwater collection	Mike Bogart (FT)
Performed potential receptor search and contacted potentially affected receptors to collect domestic water well samples	Mike Bogart (FT)
Collected data from each phase and submitted to client and MPCA	Greg Smith (PM) Mike Bogart (FT)
Prepared data tables and associated figures depicting location of sampling points and associated results	Mike Bogart (FT) Joshua Rebennack (CT) Greg Smith (PM)

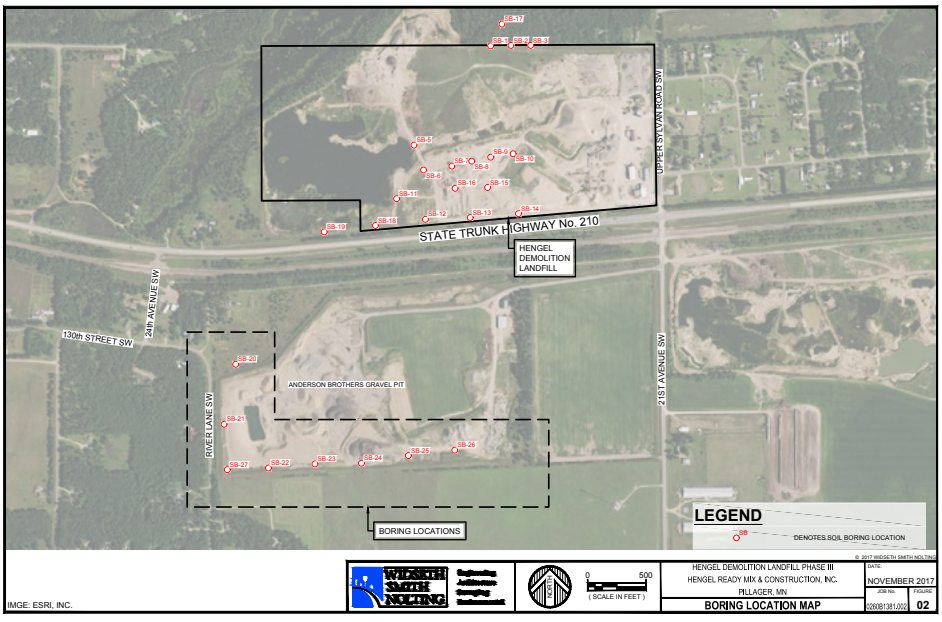
Subcontracted Tasks

The following tasks were subcontracted out.

- Advancement of soil borings
- Laboratory analysis of all groundwater samples

Outcome Achieved

The collection of the soil and groundwater data allowed for delineation of the contaminant plume extent and magnitude. Groundwater contamination is present below the facility. The potential for the groundwater contamination to affect human health and the environment exists. WSN is working with the facility to change how they operate and put into place corrective actions to manage the groundwater contamination at the facility. WSN will continue to work cooperatively with the facility and the MPCA to devise a plan allowing the facility to continue operating in accordance with future permits while protecting the environment and human health.



4. Scope of Services

Design Remediation Systems and Strategies for Remediation of Subsurface Contamination. Contaminated Subsurface Media Includes Soil, Solid Waste, Groundwater, Methane, and /or Other Vapor

WSN has designed several remediation systems for subsurface contamination including groundwater sparging, soil venting, groundwater pump out, dual phase extraction, and sub-slab depressurization. The dual phase extraction systems we have designed have used both dual and single pump technology. These systems are typically the most complex, they require management and treatment of water, air, and vapors. The systems are designed to be fully automated to minimize required operation and maintenance. We have also dealt with remedies for soil and solid waste at some open dump inventory sites. WSN was involved in a landfill gas reuse project at a municipal waste landfill in central Minnesota. Our strong background in civil engineering has given WSN significant experience with utility and municipal projects that are applicable to remedial system design as well. Most of the trenching and underground construction associated with remedial system installation are based on the principles of utility construction. We are currently working on designing a vinyl chloride groundwater contamination remedy for one of our demolition landfill clients.

Oversee, Design, and /or Conduct Pilot Testing, Bench Scale Testing, Field Demos and Treatability Studies of Remediation Systems or Technologies

WSN has designed, conducted, and overseen the completion of several pilot tests for remediation systems. The pilot tests include coordinating contractors for sparge and vent point installation, blower rental, pumps, and stripping equipment, and monitoring the pilot testing to gather information about the feasibility and efficiency of the remediation technology. We complete bench scale testing for many water and wastewater projects to determine the levels of chemical and mechanical treatment needed for producing treated water. The data and information from the treatability testing are used to design field scale pilot test and/or field demonstrations. The information gathered in the pilot test is used to design the treatment processes.

Pilot test equipment at the North Koochiching Area Sewer District wastewater treatment plant.

Prepare Corrective Action Design Documents

WSN has prepared a variety of CAD documents including Conceptual Corrective Action Design (CCAD) Reports, Focused Investigation (FI) Reports, Pilot Test Reports, Remediation System Detailed Design (SDCAD) Reports, Excavation Detailed Correction Action Design (EDCAD) Reports, Monitoring Reports, detailed plans and specifications for construction of remediation systems, remediation system operation reports, and as-built drawings. We have 30 years of experience in the preparation of these documents for sites across Minnesota and North Dakota. Our Corrective Action Design Documents are prepared by using the MPCA Petroleum Remediation Program corrective action guidance documents 7-02 through 7-08 or by using a template designed by WSN. The documents generally include a format of some background information about the site characterization, an overview of the CAD, followed by a detailed description of the proposed work, how the work will be monitored, the projected outcome, and an estimation of costs associated with the CAD. The figures included in the CAD documents show the site location, site details, location of investigation elements, location of wells and borings, CAD details, monitoring results, and cross-sections of the target zone.

Prepare Health and Safety Plans (HASP)

WSN standard procedures include preparing a site-specific HASP for each site that requires on-site activities. The level of detail for each HASP depends on the complexity of the work required for the site. A HASP prepared by WSN typically includes the following elements;

- Site location and project contact information
- Local emergency contact information, hospital location, and map
- Assignment of site safety responsibilities
- An evaluation of site hazards, including chemical, physical, and biological hazards, flammability, excavation, mechanical, drilling, electrical, utility, confined space, traffic, railroad, and temperature
- Personnel training, job safety meeting, and surveillance requirements
- Personal protective equipment requirements and upgrade and downgrade thresholds
- Monitoring procedures, equipment and applicable action levels
- Site control measures such as entry and egress, communication, site rules and work zones
- Safety Data Sheets (SDS)

Oversee Site Investigation Services for Soil Boring Advancement and Monitoring Well Installation using both Standard Drilling Methods and Direct Push Methods

WSN is a licensed monitoring well contractor and is very familiar with drilling and well installation techniques. Our scientists and field technicians are very familiar with standard drilling methods and push probe technology. We have extensive experience with mud rotary drilling, cable tool drilling, Rotosonic drilling, and laser induced fluorescence (LIF) probing. WSN does not use solid-stem flight augers unless prior approval is received from the MPCA's project hydrologist. WSN staff are very familiar with the standard drilling method of hollow stem augers with split spoon sampling. We have used hollow stem auger drilling to define the geology at 12 demolition landfills but have switched to using more push probe drilling for its speed and cost efficiency. The continuous core samples obtained when using push probe drilling provides an accurate lithology assessment during a release site investigation. This allows field personnel to make informed decisions during field investigations and enables the relay of pertinent information to the project manager for assistance in the decision-making process.

Push probes are the most common drilling method WSN has used for field investigations at demolition landfills. Push probes are often used in the early stages of an investigation to define the extent of contamination as well as determine site lithology. Push probes allow field personnel to collect continuous core samples with a less intrusive operation. WSN also uses push probe methods after the site geology has been defined but further definition of the contaminant plume is required. With the push probe method, discrete samples can be obtained with less risk of cross-contamination. Having worked at demolition landfills in Minnesota, we have encountered many different types of geology and, thus, have a good understanding of the advantages and disadvantages of each drilling method.

WSN typically uses hollow stem auger drilling for the installation of groundwater monitoring wells. However, WSN personnel have installed drive point wells at locations inaccessible by truck mounted drill rigs. We have been involved with the installation of many monitoring wells at landfills across Minnesota. At a small number of these leak sites, a downward vertical hydraulic gradient is present, which requires the installation of nested wells. WSN personnel are on-site to verify the wells are installed at the appropriate locations and are constructed in accordance with MDH and MPCA guidelines and regulations. WSN has also directed the installation of nearly 100 monitoring wells for MPCA's Ambient Groundwater Monitoring Network.

WSN completes a drilling log for every soil boring that is advanced under our direction and prepares well construction diagrams when monitoring wells are constructed, in accordance with the MPCA Guidance documents.

Conduct Ground Water, Soil, Surface Water, Sediment, and Air Sampling and Monitoring

WSN personnel have collected thousands of soil and groundwater samples and numerous surface water, sediment, and air samples from dozens of sites throughout the state of Minnesota. These sites include sanitary and demolition/debris landfills, private and public water systems, residential and business sites, and wastewater treatment systems. WSN personnel are experienced in the sampling methods and equipment needed to sample water, soil, and air resources. Including pumps (e.g., submersible, air diaphragm, bladder, and purge) and bailers (e.g., stainless steel, PVC, and Teflon®) for groundwater, and automated water bottle samplers for surface water. Soil sampling is performed using drill rigs equipped with hollow stem augers and split spoon samplers, push probes with continuous core sample capabilities, hand augers, manual push probe corers, and the occasional shovel. WSN personnel are experienced in sediment sampling using methods such as Coliwasa samplers and box cores and air sampling using vacuum canisters in conjunction with Tedlar sample bags, Drager tubes, and Suma canisters. WSN staff is experienced in conducting on-site field analyses of groundwater and surface water samples for parameters including pH, conductivity, dissolved oxygen, temperature, nitrate, iron, sulfide, and hardness. WSN is also familiar with the proper handling and chain-of-custody procedures and other paperwork necessary when samples are collected for field and/or laboratory analysis.

Conduct Vapor/Air Monitoring for Health and Safety and Air Quality Criteria

WSN conducts air monitoring in the breathing zone during field activities that could result in the potential exposure to high organic vapor concentrations. This monitoring is typically conducted using a PID. WSN has also used colorimetric direct reading gas detection tubes and sampling devices to measure specific gas concentrations in the field.

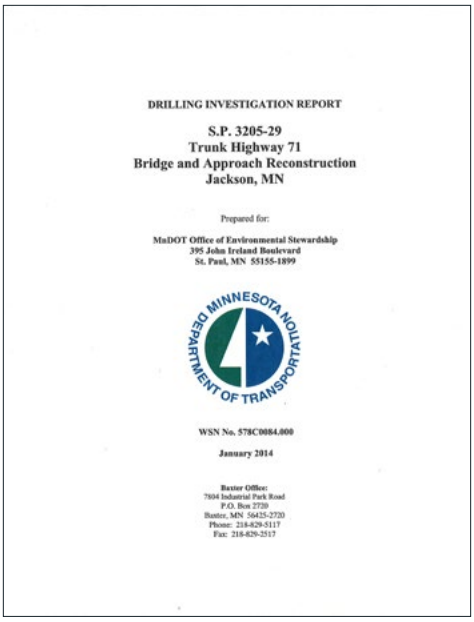
WSN has conducted indoor air sampling to determine potential vapor intrusion impacts. This sampling was conducted using Summa canisters with flow regulators. An Occupied Dwelling Questionnaire was completed prior to each sampling event and instructions were provided to the occupants to minimize the potential for cross contamination. Samples were collected over a 24-hour period and a background sample was collected during each sampling event.

At various contamination sites, the results of the vapor assessment indicate that a vapor survey should be completed in the areas where petroleum vapors could accumulate or migrate. These areas include backfilled utility trenches, sanitary and storm sewers, basements, and crawl spaces. WSN has been involved with numerous release sites where vapors have been detected and where the conditions are conducive to vapor migration or accumulation. When either of these situations are present, vapor monitoring is typically completed.

WSN is involved with a particular release site where a combination soil venting/air sparging system has been installed for the remediation of impacted groundwater. Vapor monitoring of an adjacent basement is completed periodically to assure the operating system is not forcing petroleum vapors into the structure through sewer drains or cracks in the basement walls or floor. At another petroleum release site, it was determined that a gasoline release had impacted the local sanitary sewer and storm sewer. A blower was installed to assist in the mitigation of the vapors. The source of the contamination has been removed and the blower is no longer needed; however, vapor monitoring is ongoing. WSN personnel periodically check 23 locations over a six-block area for the presence of petroleum vapors using an explosimeter and PID. During the vapor monitoring program, records are kept documenting the time, monitoring point, and explosimeter and PID readings.

This documentation is important in making an informed decision as to when the petroleum vapors are no longer a threat to human health.

Conduct and/or Oversee Site Assessment/Evaluation Activities (Phase I and Phase II), Limited Site Investigations, and Remedial Investigations



DRILLING INVESTIGATION REPORT

S.P. 3205-29
Trunk Highway 71
Bridge and Approach Reconstruction
Jackson, MN

Prepared for:

MnDOT Office of Environmental Stewardship
395 John Ireland Boulevard
St. Paul, MN 55155-1899

WSN No. 57BC0084.000

January 2014

Having completed more than 100 Phase I and/or Phase II Environmental Site Assessments (ESA), WSN is very familiar with the American Society for Testing and Materials (ASTM) standards for environmental site assessments (E 1527-05). Clients have included municipalities, financial institutions, hospitals, realtors, resorts, manufacturing facilities, corporations, individuals, and government agencies. Facilities have consisted of gasoline retail stations, dry cleaning facilities, auto body and service stations, hospitals, retail buildings, resorts, and manufacturing facilities.

Over the past five years, WSN has completed or is currently involved in two large Phase I and Phase II ESAs for MnDOT. The ESAs have been performed on the mid-town highways in Jackson and Thief River Falls. The study areas are one to two miles long.

WSN was recently involved with a Phase II ESA at a former steel garage door manufacturing facility. Review of a Phase I report indicated that petroleum storage tanks were present on the property in the past and that solvents were used as part of the manufacturing process. Because the client was purchasing the property, a Phase II was recommended to determine if past activities had impacted the property. The Phase II ESA included the advancement of several soil borings to collect soil and groundwater samples to determine if any contamination was associated with the property. Results of the Phase II indicated that petroleum contaminants were present in the soil and groundwater underlying a portion of the property. The release was reported to the MPCA Duty Officer and a leak number was issued. WSN performed additional research into the location of the former storage tanks and into contamination associated with a known release site that is located immediately adjacent to the property. The data collected supported the theory that the contamination encountered in the Phase II boring was likely related to the adjacent property release and not from the former garage door facility. This information was submitted to the MPCA for final determination as to whether the on-site contamination is associated with the adjacent property and to determine if the new leak site would be closed without additional investigation. If the MPCA determines that the contamination is not related to the adjacent property, a remedial investigation will be conducted to better define the extent of contamination and determine if the contamination is a risk to human health and the environment.

WSN has completed hundreds of remedial investigations (RI) and limited site investigations (LSI). Because MPCA's Remediation Program is a risk-based program, WSN performs an LSI with an objective to quickly evaluate the level of risk associated with the petroleum release. If the information collected during the LSI indicates groundwater monitoring wells are required, a full RI is performed. WSN has completed RIs where only three monitoring wells are necessary to define the extent of the groundwater contamination. On the other hand, we have investigated a petroleum release site with strong, vertical and horizontal gradients and 20 monitoring wells were necessary to adequately define the extent of the contaminant plume.

Conduct Surface Water, Groundwater, Air, and Vapor Receptor Surveys

Petroleum release investigations generally require the performance of one or a combination of the three risk assessments. Over the past five years, WSN has completed surface water, groundwater, and vapor risk assessments for release sites throughout Minnesota.

We consider the groundwater risk assessment as a two-phased event. When the results of an LSI indicate significant petroleum contamination, it is then necessary

to determine if the release poses a risk to the local groundwater. Assuming further investigation discovers that the risk is imminent or the groundwater has been impacted, the second phase of the groundwater assessment would be performed to determine if the aquifer is a resource aquifer or if there is sufficient distance between the impacted unit and the first resource aquifer. In either case, a water well survey, including a MGS well search and 500-foot walking survey, should be completed to ascertain the risk to local drinking water wells.

The first described risk assessment was concerned with the impacts or potential impacts to the groundwater. Assuming the groundwater was found to be contaminated, it may be necessary to complete a surface water risk assessment. This assessment considers the potential impacts through the discharge of contaminated groundwater to surface water including rivers, lakes, and wetlands. In conducting the surface water assessment, WSN first identifies those waters within one-quarter mile of the release. We then proceed with a review of the results of the remedial investigation with particular emphasis on determining if there is a clean downgradient monitoring well or soil boring between the point of the release and the concerned surface water. Assuming a clean sampling point downgradient of the release, an assessment would be completed discussing the contamination risk potential to the identified surface water.

Although not as prevalent as the impacts to the waters of Minnesota, the conditions produced by the migration or collection of petroleum vapors typically require immediate attention. Depending on the surrounding soil conditions, petroleum vapors may readily move through the ground and can produce explosive conditions. Because of these potentially dangerous situations, vapor risk assessments are an important part of a petroleum release investigation and should be implemented soon after discovering the release. The most critical vapor risk setting is when the contaminated groundwater intersects utility trenches, basements, and sewer lines. In a scenario such as this, the assessment would include a discussion regarding the location of these subsurface features with respect to the release or the impacted groundwater. If it is determined that there is a history of vapor impacts in the area or the potential for vapor migration or accumulation exists, a vapor survey would be completed as soon as possible.

Arrange for Transportation, Storage, and Proper Management of Wastes

WSN has been involved with numerous corrective action sites where wastes are generated and need to be managed. Wastes commonly generated during the course of corrective action activities include contaminated groundwater, contaminated soils, and free-product. WSN staff is experienced in the removal, storage, transportation, and treatment of wastes generated through corrective action activities. WSN has worked with numerous contractors including excavators, truckers, thermal treatment operations, and land farm operators, as well as private landowners where arrangements have been made to treat contaminated soils. WSN staff is also familiar with completing the necessary applications and notification forms required by the MPCA to track the progress of soil treatment activities. These include land treatment site approval, approval to thermal treat, soil batch approval, notification of spreading contaminated soils, and soil monitoring results reporting. WSN has arranged for pumper trucks to remove and dispose of wastes (i.e., old product and contaminated groundwater) found in underground and above ground storage tanks before removal. We have also coordinated the removal of highly contaminated groundwater from underground storage tanks prior to excavation. WSN personnel have also arranged for drums and/or skid-mounted storage tanks to be on-site for the temporary storage of free-product recovered as part of corrective action and subsequent disposal of the recovered free-product and/or contaminated groundwater waste.

Rotosonic Drilling Waste, Biwabik Assessment, Biwabik, MN

Evaluate the need for and Oversee the Implementation of Alternative Drinking Water, Including Point-of-use Treatment (i.e. Carbon Filtration)

WSN's staff has been involved with the installation of several alternative water supply sources and two, point-of-use treatment systems. The alternative water supply source investigations required the assessment of the current water supply source, investigating the geology to locate another aquifer, completing the specifications for a new well and installing the new well using registered well contractors. The point-of-use treatment included maintaining an activated carbon filter system to remove the contaminants from the water supply system. WSN staff have also been involved in the location of new well fields/alternative water supply sources for numerous communities around Minnesota, including an alternative water supply source for a community whose municipal well had been contaminated with nitrates. In addition, WSN staff has designed extensions of municipal water supply systems to connect private residences and businesses throughout Minnesota. In some of these designs, the driving force was impacted private water supplies and the presence of a municipal water supply system in the area.

Sioux Oil GAC System (point of use treatment)

Coordinate and Cooperate with other State-Contracted Services such as Sampling and Analytical, Emergency Response Contrators, and Hazardous Waste Services

WSN coordinates with other State contractors for their services on a regular basis. Throughout the past few years, we have worked with State contracted laboratories and drilling companies on over 100 projects. Initially, a project manager verifies that the tasks assigned to the State contractor are within the scope of the State Contract prior to issuing a State Contract Order Form (SCOF). We complete the SCOF using the State contractor's information and the unit prices listed in the applicable Minnesota Department of Administration's Contract Release. We are aware that it is essential the SCOF is signed by WSN and the State contractor before commencing the work.

WSN has also worked with State contractors for electrical services. Four active sub slab vapor points and an exhaust fan were installed to remove vapors from the basement of a residence in Moorhead. The current owner of the home is not the responsible party and chose not to pay the electrical charges associated with the vapor extraction system. Consequently, a State contracted electrician was retained to install a separate electric meter for the vapor extraction system.

Benzene was detected in a drinking water well above the established health risk limits (HRLs) at a petroleum release site in Winger. WSN coordinated with the MPCA and a State emergency response contractor to expedite the installation of a carbon filter treatment system at the residence until a long term drinking water solution could be implemented. Because WSN was responsible for the maintenance of the treatment system, we also found it necessary to work with a State contractor to obtain replacement carbon filters and dispose of the contaminated carbon.

Oversee Subcontractors and State Contractors During Investigation, Cleanups, and Construction Activities

WSN routinely performs oversight of contractors and subcontractors during investigation and clean up. Subcontracted tasks for which WSN provides oversight for includes drilling services, excavation, remedial system installation, equipment assembly, electrical, plumbing, demolition, application of soils, dewatering, composting, and construction. WSN has provided oversight for all phases of several remedial system installations and multiple contaminated soil excavations.

Observing State Contractors, Mitigation Project

In addition, WSN has provided oversight of utility contractors during removal of soil contamination during utility projects.

WSN worked with Otter Tail County on a project that consisted of three tax forfeited properties, all containing underground petroleum storage tanks. In addition to the tanks, each site contained abandoned buildings, which also needed to be razed and removed. WSN was responsible for the preparation of bidding documents for the removal of any and all petroleum storage tanks and the removal of all on-site structures and debris. It was decided to award the work at all three sites to one contractor. WSN provided the oversight at all three sites. Along with the preparation of the bidding documents and assisting the County in selecting a contractor, WSN was on site to assure the work was completed in accordance with the scope of work outlined in the project specifications.

WSN has been involved with tank removals at petroleum sites since we began doing environmental work. As an engineering and environmental consultant to several Counties and Cities, WSN has designed tank replacements for many different sites, including airports, a bus garage, an electric power plant, nursing homes, maintenance garages, fish hatcheries, wastewater treatment plants, and schools. These replacements have included removing tanks from 300 to 15,000 gallons in size. We are familiar with the issues and problems involved in tank removals. Another area we have utilized our tank removal expertise is assisting Counties with removal of tanks on their tax-forfeited properties. Recently, we have been involved with numerous above ground tank removals, both as a prime contractor and as a subcontractor. WSN has also overseen the removal of several abandoned tanks encountered during utility installation projects. These tanks typically are not anticipated and must be addressed after they are discovered.

Prepare and Evaluate Reports (E.G., Investigation Reports, Monitoring Reports, Free Product Recovery Reports


WIDSETH SMITH NOLTING

LIMITED INVESTIGATION REPORT

OF

Former Seaforth Salvage
MPCA SA4064
Seaforth, Minnesota

Prepared for:

Minnesota Pollution Control Agency
Attn: Sondra Campbell
RCRA | Remediation Division
520 Lafayette Road
St. Paul, MN 55155

June 30, 2017

WSN No. 0264B0130.000

There are numerous documentation reports associated with MPCA's Superfund program. The report most often associated with investigations is the Remedial Investigation (RI) Report Form. This report is used to document work performed during the Remedial Investigation. The RI Form will provide sufficient information to allow the MPCA's project manager to make an informed site cleanup decision. As directed, care is taken not to revise or delete any part of the text or questions in the RI Report. Furthermore, to assist MPCA's project manager in the decision making process, WSN personnel are encouraged to provide any additional investigative information that they believe will assist MPCA in making a site cleanup decision. Other information is added in the appendices such as analytical data, boring logs, monitoring well construction logs, methods, and procedures, and previous reports, if available. WSN as completed investigation report forms for hundreds of sites since the early 1990s.

WSN has done several assessments for the MPCA to determine the nature of contamination so that MPCA staff can determine their next step. The reports may range from including Phase I Environmental Assessments to Assessment Reports that simply discuss the sampling results. In all of these reports, we pride ourselves on providing detailed site maps so the buildings, roads, borings, and other structures are spatially accurate.

The MDA also has a series of guidance documents starting with the Remedial Investigation Work Plan (Document GD9) and going through Groundwater Sampling Guidance (GD12). WSN has worked with all the documents and is familiar with the documents and MDA's approach both by working directly for MDA and by working with private parties required to address the contamination.

Evaluate Invoices and Data Reports

WSN has a system set up to evaluate invoices and data reports. When subcontractor invoices or data reports are received, they are reviewed by the

project manager who compares the work requested with the billed amount and the analytical results. The project manager then checks the field reports to confirm that the number, amount, and type of units on the invoice and data reports match what was completed in the field. If there is a discrepancy, the project manager contacts the subcontractor and resolves the discrepancy or asks for a new invoice and data report. Once the invoice reflects the work completed, the project manager signs and dates the invoice, puts the WSN project number on it, makes a copy for their file, and sends the original to our business office for billing.

Collect and Manage Field and Laboratory Data for Electronic Submittal in a format specified by MPCA

WSN collects and manages large amounts of field and laboratory data for submittal to MPCA in the electronic data delivery (EDD) format. WSN has worked with labs to provide the data to us in formats where we can download the data directly into MPCA tables within report worksheets. The project manager reviews the data reports to see that they are complete, contain the data requested, the data QA/QC is reported, and the data match the field reports. If there are discrepancies, the project manager contacts the subcontractor to resolve the difference and/or obtain a revised data report. WSN samples groundwater monitoring wells at 12 landfills and the EDD system is used by us to submit the data to MPCA as part of the permit. In addition, WSN samples surface water at MPCA Watershed Pollutant Load Monitoring Network (WPLMN) sites in the central portion of the state for the Mississippi Headwaters Board (MHB). The field data from this sampling is submitted to MPCA in the Canvas® format and EQUIS template. The analytical data is submitted to MPCA using the EDD system.

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Y Y		0.0075	0.020 %
Y N	Below Reporting Limit	<	0.0075
Y Y		0.0075	0.020 %
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SC Y Y			0.0025
TRG Y N	Below Reporting Limit		
SC Y Y			0.0025
Actual	TRG Y	Y	

EDD format example

Evaluate Data Quality and Data Verification Reports

In preparing data verification reports, WSN follows the criteria listed in MPCA's fact sheet "Laboratory Data Checklist." WSN's project manager is responsible for reviewing the laboratory data and preparing the associated data verification report. After the data has been sufficiently reviewed, a report is prepared which includes information regarding hold times, laboratory calibrations, reporting limits, and analytical results of blanks, surrogate, and matrix spike samples. An overall assessment or summary of the data is included and the report is signed by the project manager.

Arrange for Site Access

WSN routinely works with clients and adjacent property owners for site access with respect to landfill investigative activities. Clients are informed about the details of the investigative activities and how they relate to site access issues such as drilling in drive areas and other areas that may be difficult to access. Any client concerns about access locations and access times are taken into consideration when performing investigations. Access to immediately adjacent properties is also necessary in many projects. If off-site access is necessary to complete an investigation, the client is informed and asked for their input into the adjacent property on items such as owner name and relationship with the adjacent owner. WSN subsequently contacts the property owner and discusses the ongoing investigation and explains the need to access their property for completing the investigation. If access is granted, an agreement is obtained in writing from the adjacent property owner prior to continuing the investigation. If sufficient information regarding the likelihood of needing off-site access is known, prior to initiating the investigation, access agreements would be obtained before beginning investigative activities to avoid delays. WSN is also familiar with the procedures and policies employed by the local railroads for obtaining access to railroad property for investigation and remediation activities. WSN personnel have also completed the Contractor Orientation Course required by the railroad to access their right-of-way for investigative activities. WSN has experience negotiating access agreements with private parties, cities, counties and MnDOT.

Coordinate Utility Locates by Contacting the Appropriate Entity and if Applicable Coordinate Traffic Control

WSN is very familiar with utility locates and utility meets. Prior to completing any subsurface investigations (i.e., soil probes, soil borings, test trenching, excavation, etc.) WSN contacts Gopher State One Call to complete a utility locate. Whenever possible, a utility meet is performed instead of a blank locate. We feel a utility meet is a better means to reduce the chance of encountering underground utilities because the locations of the proposed underground work can be directly relayed to the respective utility locators. In addition, a utility meet is also preferred by the utility companies because it reduces the time they spend on locates and helps maintain good working relationships with the utility companies. WSN has also contracted with a private utility locator to perform a locate on areas or properties that have limited and/ or incomplete public utility or private utility information. On occasion, investigation activities occur within an area where traffic control is needed. In such instances, WSN has engineers that are familiar with traffic control and signage issues. If necessary, a traffic signage company such as TSS or 3D is contacted about setting up the appropriate signage. In instances that do not involve a state highway, the local governing agency is contacted to coordinate traffic control issues.

Prepare and Evaluate Bid Documents (e.g., plans and specifications), Advertisement for Bids, Including, But Not Limited To, Landfill Cover Systems, Remediation Systems, Landfill Gas Systems, and Erosion Repair Projects. All Plans Shall Comply with the Rules and Requirements of the MN Dept. of Administration and the MPCA

WSN staff complete many bid documents every year for our municipal, county, private, and state clients. All of our large engineering projects require preparing plans and specifications and uploading the documents to QuestCDN to advertise the bids. We work with our clients to answer questions about the bid documents, collate bidder lists, review the bids, make sure the math is correct in the bid, determine if the contractors meet the bid requirements, tabulate the bids, and assist with awarding the contracts. We have done the bid document work for landfill cover systems, remediation systems, and erosion repair projects. Because we have worked for MPCA for 15 years, we are familiar with the rules and requirements of the MPCA and the Dept. of Administration including the State of Minnesota Supplemental Agreement Construction Contract process. One of our most recent erosion repair projects is currently being bid for the Center Range at Camp Ripley near Little Falls, MN.

Prepare and Review Quality Assurance Project Plans (QAPP) and Sampling and Analysis Plans (SAP) in accordance with state and federal requirements

WSN is very familiar with Quality Assurance Project Plans (QAPPs) for MPCA's Site Assessment program and with the EPA Model QAPP. We understand the objectives of the QAPP and the information needed for the plan approval. We have been preparing QAPPs for the MPCA Watershed Pollution Load Monitoring Network (WPLMN) each year for the last three years for several surface water sampling locations in the central part of the state for the Mississippi Headwaters Board. WSN has worked with laboratories and chemists in obtaining Standard Operating Procedures (SOPs) and provided the needed QA for the analyses to be completed. We have prepared several SAPs for groundwater sampling at demolition landfills and wastewater treatment facilities. For these, we have used MPCA's Groundwater Sampling and Analysis Plan and Protocols. WSN is currently reviewing and revising the Water Quality Monitoring Protocol for the Crow Wing County Landfill Monitoring which includes sampling of wells, leachate, and surface water. Other landfills

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

WPLMN
Quality Assurance Project Plan
Watershed Pollutant Load Monitoring Network (WPLMN)

Doc Type: Grant Application

Document control

This document has been prepared according to the U.S. Environmental Protection Agency (EPA) publication, *EPA Requirements for Quality Assurance Project Plans* (U.S. EPA QA/R5, March 2001). This Quality Assurance Project Plan (QAPP) will be reviewed annually and updated as needed. Updated versions of this QAPP will bear a new (x + 1) revision number. The local partner will assume responsibility for archiving outdated versions of this QAPP which will be kept at project headquarters. Archived versions of this QAPP will be retained for a minimum of ten years from the date of archival.

Process

Step 1: The local partner drafts a Project Summary in Part I, reviews remainder of QAPP, and sends the draft QAPP electronically to the analyzing lab for completion of Table 1.
Step 2: Analyzing lab completes Table 1 and returns to the local partner.
Step 3: The local partner submits the draft QAPP electronically to the Minnesota Pollution Control Agency (MPCA) Project Manager and Quality Assurance/Quality Control (QA/QC) Coordinator for review.
Step 4: Upon approval, the local partner will contact the lab sign one copy and send to the local partner. The local partner will sign and send to the MPCA Project Manager.
Step 5: The MPCA Project Manager will sign and send to the MPCA QA/QC Coordinator for final signature.
Step 6: The MPCA QA/QC Coordinator will sign and scan the QAPP. Electronic versions will be provided to the MPCA Project Manager, local partner, and analyzing lab. The MPCA QA/QC Coordinator will retain the original copy of the QAPP.

Note: The QAPP needs to be finalized prior to receiving the first reimbursement of funds and prior to any sampling and lab analysis.

Certification

By their signatures below, the undersigned attest that they are familiar with the requirements of this document and agree to fulfill their responsibilities as specified herein.

Project title: Mississippi Headwaters Board WPLMN Sampling

QAPP project organization:

Analyzing laboratory responsibility – must be MDH or MPCA accredited and certified for all certifiable parameters shown in Table 1, conduct sample analysis of certifiable parameters; submit analytical data to the local partner and the MPCA Project Manager; complete Table 1; and participate in the MPCA's Lab Round Robin efforts.

Analyzing Laboratory: Pace Analytical Services
Laboratory representative: Kabor Xiong — Email: kabor.xiong@pacelabs.com
Signature: _____ Date (mm/dd/yyyy): _____

Local Partner responsibility – adhere to QA/QC procedures; review, validate and submit data; conduct sampling activities.

Organization name: Mississippi Headwaters Board
Water Sampler name(s): Joey Goeden and Mike Bogart
Project Leader: Tim Terrill — Email: terr@mississippiheadwaters.org
Project Leader signature: _____ Date (mm/dd/yyyy): _____

MPCA Project Manager responsibility – technical assistance; training; data review.

Project Manager name: Jim MacArthur — Email: jim.macarthur@state.mn.us
Signature: _____ Date (mm/dd/yyyy): _____

MPCA Water Quality QA/QC Coordinator responsibility – QAPP review and QA/QC resource for problems and concerns.

QA/QC Coordinator: Sandy McDonald — Email: sandy.mcdonald@state.mn.us
Signature: _____ Date (mm/dd/yyyy): _____

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wq-awm2-06b • 1/15/16 Page 1 of 4

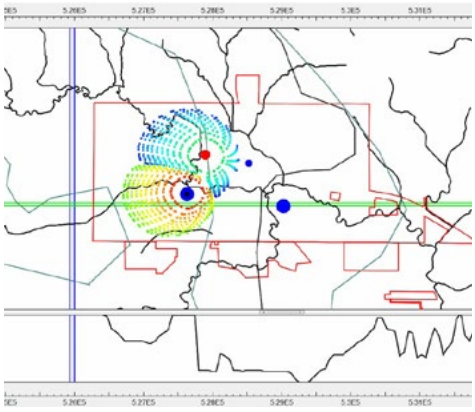
where WSN has recently prepared or is currently working on SAPs include Hengel Demolition Landfill, Douglas County Demolition Landfill, Grinning Bear Demolition Landfill, Todd County and Omega Demolition Landfill. WSN has also prepared Phase II Investigation Workplans for some of the Brownfield Program sites we have investigated.

Perform/Oversee Remedial Action Plans

WSN has performed and overseen remedial action plans at contamination sites. These have often included excavating the source area or waste material and treating it or relocating it to lined municipal or hazardous waste landfill. We have also worked on several sites where a development response action plan was needed to address the contamination. The largest remedial action plan was for the Lake Bemidji South Shore Development, where the remedial work included excavating material in an ash landfill and relocating it under low-permeability material covered area. Other work at this site involved putting additional cover material on a wood waste landfill area and assessing neighboring parcels for methane gas.

Conduct Surface Water, Groundwater and Hydrodynamic Modeling

WSN has completed surface water and groundwater modeling as part of our water resource and hydrogeologic studies for a variety of projects. The surface water modeling is used to estimate flood volumes for bridge, ditch, road crossing, dike, and flood impoundment studies as part of engineering design projects. In general, watershed scale studies use HEC-RAS to look at different storm events, such as 10-year and 100-year floods. For smaller stormwater runoff and treatment studies, models like HydroCAD are used to estimate water quantities. For groundwater modeling, we use ModFlow to look at the effect of pumping on groundwater levels in observation and drinking water wells. This modeling is usually used for wellhead protection plan studies, but we have also used them to estimate response to remediation wells. WSN staff have used the Regional Ocean Modeling System (ROMS) for hydrodynamic modeling.



Groundwater modeling results of Pine Island wells

Conduct Third Party Review and Analysis of Technical Information for the Purpose of Providing Conclusions and Recomendations to the State

WSN has conducted review and analysis of technical information for many of our municipal, state, and county clients. Recently, we are providing review of pilot testing plans/reports and sewer lining plans on the Holiday Station Store #369 for the City of Baxter and assisting them with conclusions and recommendations regarding risks to their sewer and water distribution infrastructure. WSN has also provided MPCA third party review of municipal water well installation projects for the Park Region Coop (Leak Site 8524) in Pelican Rapids and Public Supply Well Contamination (Leak Site 122) in Foley. These reviews resulted in brief reports to the state describing our analysis and conclusions. On another project, Long Prairie Creamery (Leak No. 155) in Long Prairie, we provided structural review of an adjacent abandoned building and provided recommendations to MPCA on if the building could be demolished for remediation work without damaging an adjacent building.

Perform 5-Year Reviews and Site Reviews

The Compensation Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) is referred to by the public as Superfund. Under CERCLA, a five-year review is required when a response action is implemented. The purpose of the five-year review is to evaluate the execution and performance of the remedial action. The review will determine if the action continues to be effective in protecting human health and the environment. WSN worked with the MPCA on a Superfund site in Brainerd, the Former Brainerd Foundry. The site had an initial removal action completed by EPA in the 1980s. WSN was hired to review the removal action and performed a followup RI/ES at the foundry. In other work, WSN was hired

to complete site reviews of the Brainerd Dump in Crow Wing County and the La Grande sanitary Landfill in Douglas County. These reviews were completed for clients needing an understanding of the contamination and remedial actions completed at the sites.

Review Groundwater Remediation Technologies and Recommend alternatives and Optimization options

WSN is familiar with groundwater remediation technologies and can recommend alternatives and optimization methods. We have designed and used most of the known groundwater remediation technologies, including unsaturated zone soil gas venting, groundwater sparging, dual phase extraction, free product recover, cutoff trenches, oxygen releasing compound (ORC®), combination sparge and vent, surfactants, and groundwater pump and treat. We have many years of experience with large capacity groundwater pumping wells and work with our clients on maintaining the efficiency and specific capacity of these wells. We also look at methods to optimize their wellfields and the groundwater treatment systems. We are currently reviewing a groundwater remediation pilot using surfactants and ORC®, with groundwater extraction.

Provide Evaluation and Design of Energy Recovery Systems Utilizing Landfill Gas

WSN was involved in the evaluation and design of an energy recovery system using landfill gas for the Crow Wing Municipal Waste Landfill. We worked on the transport piping to the landfill gas location.

Research, Evaluate and Implement Innovative Technologies

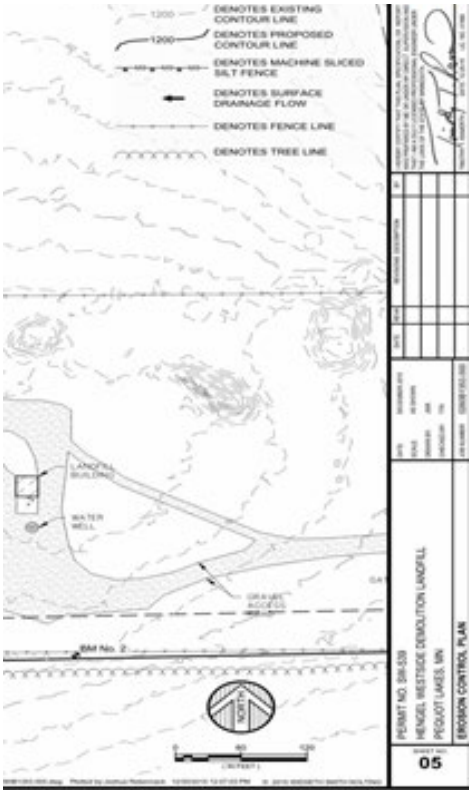
WSN was part of the initial assessments completed for oxygen releasing compound (ORC®) in Minnesota at the Farmers Association Coop (Leak No. 869) in Deer Creek. At this site, we researched the technology, implemented ORC® injections on two trial areas, and evaluated the results in the downgradient groundwater monitoring wells and Deer Creek. At the Biwabik City Hall site, WSN implemented a new technology, at the time, passive soil gas monitoring to assist with determining source area for a perchloroethylene (PCE) release. This was found to be a quick and cost effective approach to assessing an area to lower the cost of drilling needed for the investigation. WSN staff are always researching and evaluating new technologies to stay abreast of the remediation industry.

Prepare Presentations and Present Information at Meetings

WSN staff have a lot of experience preparing presentations and presenting information at meetings because we attend many city council, county board, planning and zoning commission, and other public meetings. Often we are presenting technical information to the general public with powerpoint presentations or graphs. WSN environmental staff also have experience giving presentations about our work at conferences and presenting rules information to our clients. As part of many wetland permit applications, we are required to present project and permit application information to various agency staff in technical evaluation panel (TEP) meetings.

Prepare and Determine if the Stormwater Pollution Prevention Plan (SWPPP) is being followed and Make Recomendations if Revisions are needed during the life of the Construction Project

WSN prepares dozens of SWPPPs each year for our many construction projects for municipalities, counties, and state agencies. We have several staff with Design of Construction SWPPP certifications, who put together SWPPPs using the MPCA SWPPP Templates for Construction Sites. The completed template accompanies project plans and specifications, which includes sheets with maps showing nearby waters and wetlands, existing and final grades, locations of disturbed areas, erosion control BMPs, and standard details for the BMPs. We have staff who are certified Construction Site Managers to observe if the SWPPP is being implemented correctly and document the problems with inspection notes. We are familiar with the process to revise the SWPPP during construction based on site-specific issues that arise during construction.



Prepare Erosion Control Plans and Oversee Implementation

WSN prepares erosion control plans for many of the construction projects we design, including the fourteen demolition debris and other landfills we work with each year. We are familiar with the requirements of erosion control plans and have construction design details for drainage control berms, silt fences, drainage swales, stilling basins, overflow structures, and armored drainage swales as well as others. We oversee and observe the construction of the erosion control features on most of the projects we design to make sure they are constructed as designed.

Provide Technical Assistance to State in the Evaluation and Interpretation of Data and Information

WSN has experience providing technical assistance to the state for several of the MPCA projects we have worked on for them. This includes evaluating data and providing information on several water system corrective actions for Laporte, Foley, and Pelican Rapids. We have also been tasked to provide a building structural evaluation for an MPCA leak site in Long Prairie. Our staff are familiar with the MPCA investigation and remediation process and have worked together with MPCA on many contamination sites. We have staff who specialize in collating data and providing statistical analysis of it to evaluate the data and provide conclusions.

Assist and Provide Training as Requested by the MPCA Regarding Topics Related to the Scope of this Work

WSN provides training and seminars internally for employees and for clients. Recent internal training provided by WSN for its employees included project construction management and contaminated soil management during utility projects. WSN also provides training for clients related to regulatory compliance. In conjunction with completing Spill Prevention Control and Countermeasure (SPCC) plans for a chain of service stations in the upper Midwest, WSN prepared and presented training in SPCC regulations and standard operating procedures for UST compliance. We routinely meet with this client to assist them with UST system audits and train their staff in UST monitoring requirements. WSN prepared and hosted training for demolition landfill operators related to new MPCA regulations and ongoing compliance requirements.

Follow MPCA Green Practices/Procedures Relative to Remediation Projects

WSN is well versed in MPCA's Green practices requirements because since their implementation for stimulus act (ARRA) projects in 2009. In response to the Green practice requirement, we joined the Minnesota Waste Wise program to help us look

our resource usage and evaluate ways we can be greener. WSN has always looked at ways to cut travel and equipment costs by teaming field work with other projects for both our field staff and contractors, but the green practices requirements helped us to formalize our process and put them into greater usage. We have been regularly using the Green Practices Work Plan Attachment for our Petroleum Remediation Program work plans over the last several years.

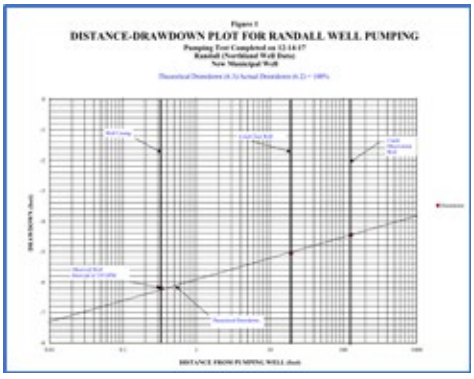
Regarding green practices for remediation projects, WSN has used the green practices to consider all the environmental effects of corrective action implementation and look at options to minimize the environmental footprint of remediation. We attended MPCA's Green Remediation Day training and have discussed the program at our Environmental Services department meetings. Some of WSN project managers have taken the Interstate Technology and Regulatory Council (ITRC) training class for Green and Sustainable Remediation. We have reviewed the Green and Sustainable Remediation: A Practical Framework document also put out by ITRC. We understand EPA's core elements of minimize energy use, air and greenhouse gas emissions, and water use and reduce waste and protect ecosystems for green cleanup. As part of a foundry emission investigation and cleanup, we are incorporating green remediation ideas into our planning for the remediation. We are aware of the green remediation SiteWise™ and SRT tools for assistance with quantifying environmental impacts.

Oversee Hydrogeologic Investigations including Fate and Transport Modeling

WSN's geologists and engineers have overseen many hydrogeologic investigations for our contamination site and municipal clients. The hydrogeologic investigations have occurred all over Minnesota and North Dakota, with a wide variety of hydrogeologic environments. One of our most recent has been an investigation of low-level vinyl chloride contamination from a demolition debris landfill in central Minnesota, where the geology consists of over 100 feet of coarse sand and gravel. Here we are assessing groundwater flow and contamination at varying depths. In addition, we have completed several hydrogeologic investigations in search of new water supplies for cities that have had their wells impacted by nitrate or petroleum contamination. One of the largest investigations was for the City of Baxter, who had their wells impacted by benzene and found the aquifer was vulnerable at the current wellfield. WSN completed a hydrogeologic investigation for them to identify an area for a new and larger wellfield. The investigation looked at over 100 residential wells and completed a dozen deep test borings to evaluate area geology and aquifer characteristics. After a large aquifer area was identified, a test well and observation wells were installed to complete a pumping test and evaluate water quality. We completed fate and transport modeling of the benzene from the contamination at the old wellfield to determine the potential to impact the new wellfield. Some of the hydrogeologic investigations have been for sites with shallow bedrock such as Gooseberry State Park leak site and City of Bigfork new municipal well.

Complete Capture Zone Analyses

WSN has completed capture zone analysis on many remediation and municipal wells to determine the extent of the pumping cone and evaluate well interference. One of most complicated was the City of Baxter wellfield, where four wells were to be installed and an assessment of the capture zone was needed to look at spacing for the wells to prevent excessive well interference. The assessment also had to consider the potential for future wellfield expansion with at least two additional wells. The capture zone analysis continued with groundwater modeling to delineate the wellhead protection area and assess contaminant migration. A remediation site where we completed capture zone analysis was the Edwards Oil site in Virginia, MN; here we did pumping tests to determine the spacing of remediation wells for dual phase extraction.



Perform/Oversee Aquifer Pump Tests

WSN has completed many pumping tests on remediation and municipal wells. One of our most recent pumping tests was on the new municipal well at Randall, MN. The new well was needed because nitrate contamination above 10 mg/l resulted in the Minnesota Dept. of Health requiring them to shut down their contaminated well. Working with the city staff and MDH, WSN's investigation work found a deeper aquifer that did not have nitrate contamination. The pumping test of the new well was completed to look at aquifer characteristics, including the zone of influence for the well. WSN coordinates and oversees pumping tests on all the municipal wells we design and have installed. Other recent municipal well pumping tests include wells for the cities of Herman, Bigfork, Graceville, Cyrus, Big Falls and Wendell. We also have done aquifer pumping tests on several remediation wells over the years.

Perform/Oversee Evaluation of Soil Borings, Test Pits, Environmental Boring and Soil Testing to Determine Cover Integrity and Avaliability of Suitable Soils

WSN has completed evaluations for cover integrity and availability of suitable soils at several sites. We recently did test pits and hand auger environmental borings at a closed demolition landfill in northwest Minnesota to assess cover integrity. We were involved in looking for cover material for the Walker-Hackensack closed landfill in Cass County and complete evaluation of suitable liner soils for many of our wastewater treatment pond projects. WSN works with geotechnical contractors to complete the soil borings and tests for our clay dike materials for our water resource projects, such as the North Ottawa Impoundment site in Grant County, MN. We are familiar with the soil tests and characteristics needed for cover and liner materials.

Soil boring to determine soil characteristics at Crow Wing Landfill

Arrange for Geophysical Activities

WSN does not have geophysical capabilities in house, but has subcontracted geophysical studies to several subcontractors. We have used subcontractors for magnetometer surveys, seismic refraction/ reflection surveys, and resistivity studies. We have also worked with the Minnesota Geological Survey in using Bouguer gravity anomaly readings in searching for new water supply sources for communities in Minnesota. WSN staff members are familiar with the purpose and applicability of other geophysical techniques including seismic reflection/refraction and ground penetrating radar. Recently, we have worked with the City of Little Falls in assisting with completion of a seismic reflection survey to determine depth to bedrock as part of their search to locate a bedrock valley for new water well locations. We are currently working with their staff to conduct a magnetometer search for old municipal wells as part of their wellhead protection plan implementation.

Conduct/Oversee Studies of Hydrogeology, Geology, and Soils Utilizing Geophysical Studies, Modeling, and Dye Trace Studies

WSN has completed hydrogeologic, geologic, and soils studies using geophysical methods and computer modeling. We worked with a subcontractor to do a seismic refraction study for the City of Little Falls to determine depth to bedrock as part of a hydrogeologic and geologic study to locate new municipal wells. We also competed computer modeling of groundwater flow for the Little Falls as part of their wellhead protection planning, which we have also done for the cities of Baxter, Kasson, and Pine Island. WSN engineers are familiar with using ground penetrating radar (GPR) for looking at pavement and soil liner thicknesses. We have also been involved in a MnDOT project where GPR was used to locate underground utilities and evaluate soil structure. We have also used borehole geophysics on some of our municipal well projects to locate the more permeable zones in the geologic boreholes. WSN staff are familiar with the different geophysical methods available and the use and limitations of each for geology and soil studies.

Prepare Construction Cost Estimates Using Standard Engineering Practices

WSN is preparing construction cost estimates almost daily for our municipal, county, private and state construction project work. The construction costs estimates are generally for road construction and utility construction, but we are also estimating costs for landfill covers, wetland restoration, and building construction. Most of our construction cost estimates use bidding tabulations from previous projects to make the cost estimates because these are the most reliable for recent construction costs and take into consideration the costs of fuels and raw materials. Part of the reliability of construction cost estimates depends on having good estimates of the amount of soil and rock that needs to be moved or the amount of pipe, geotextiles, and concrete that needs to be used. We also use the RSMeans Construction Cost books for items we haven't recently bid or to compare bid information to national and Midwest information. With our eight offices spread across Minnesota and North Dakota, we are able to evaluate regional variables for construction costs in Minnesota.

Assist MPCA During the Bidding Process

WSN has extensive experience in assisting our clients with the bidding process because we work on many public sector projects for municipalities, counties, and state agencies. WSN engineers and scientists are very familiar with developing plans and specifications, designing projects, advertising the project for bids, answering bidding questions, preparing bid addendums, conducting pre-bid meetings, evaluating bid submittals, preparing bid tabulations, evaluating bidder qualifications, and assisting with contract award. We act as city engineers in many communities and commonly assist them during the bidding process. We have also assisted MPCA on obtaining bids for the Multi-Site and Master Contract work. At any given time, our company is assisting four to six clients with the bidding process on different construction projects.

Provide Project Management and Construction Oversight

WSN considers ourselves experts in project management, administration, and oversight because we handle many construction projects each year. Our project managers have years of experience managing construction projects from designing the project to closing out the construction and processing final pay requests. We have staff with Construction Management degrees and put many of our staff through a project managers "bootcamp" to train them about project management skills.

WSN's project managers coordinate the start of the project by convening a pre-construction meeting with the owner representative, contractors, subcontractors, utility companies and sometimes a representative of the funding agency. Our project managers prepare meeting agenda and minutes from the pre-construction meeting. At these meetings, we require the contractors submit project schedules which are reviewed and discussed. Before the project starts, we make sure the contracts are fully executed and that the contractor's insurance submittal meets the specification requirements. The project managers also review shop drawings and material information submitted by the contractor to see if they meet the specifications. The project manager also schedules and coordinates WSN's construction observation staff and make sure the project boundaries and elevations have been staked.

We have several staff with years of construction observation experience, who are qualified to be on site during construction. They are familiar with the plans and specifications because they have usually been involved in the design and of the project and preparation of the construction documents. They take notes and photos and coordinate with the project manager if construction issues or questions come up. They work to see if the construction specifications and plans are being adhered to and that the needed material testing is being completed at the correct place and time. They attend the weekly progress meetings and assist with providing a summary

Crow Wing County Landfill liner installation observation

of the meetings. Generally, our staff on site have the SWPPP Site Construction certification and take care of erosion control measure inspections.

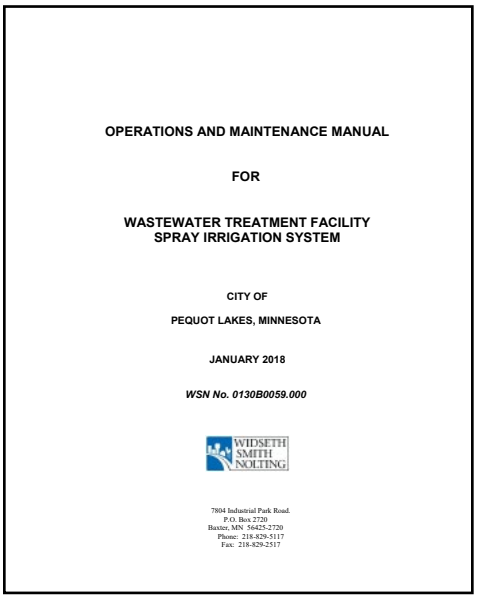
Our project managers are responsible for coordinating weekly progress meetings, preparing the agendas, and distributing a summary of the meeting minutes. They also take care of reviewing invoices and approving contractor pay requests. They participate in meetings and often are presenters at public and project meetings. The project managers also coordinate equipment start-up and work with contractors and vendors to trouble shoot problems for newly installed remediation system equipment. They also coordinate the preparation of construction documentation and operation and maintenance manuals. They often continue to provide consulting services to the client on the continued operation of the system and assist with training in staff to operate and monitor the project equipment.

Prepare Construction Documentation Reports

WSN often prepares post-construction documentation reports. These can include as-built drawings to show the location of the actual project elements, project closeout reports, operation and maintenance manuals, and reports to funding agencies. The as-built drawings, also called record drawings, usually require a survey or use of notes from the construction observer on site during construction to show where there may be changes in equipment, locations, or depths from the project plans. In addition, there are often reports to MPCA such as Corrective Action Excavation Reports, soil treatment reports, and Remediation System Operation Monitoring Reports. In some cases, there are reports to other agencies like DNR to provide them information for the water appropriation permit for a groundwater pump-out remediation system or replacement municipal wells. The Minnesota Dept. of Health requires documentation for bacteria and pressure testing, although these do not have to be submitted, just available in the project files. There are also notice of termination to be filed for stormwater permits and, in some cases, the initial discharge monitoring reports (DMRs) for NPDES discharges.

Prepare Operation and Maintenance (O&M) Manual

WSN prepares operation and maintenance manuals for many of the construction projects that we have designed and managed construction. The O&M manuals are generally for projects with mechanical parts and equipment, such as water plants, wastewater treatment systems, and remediation systems. They generally include sections with a general description of the project, a description of system components, start-up and shutdown procedures section, operation procedures, maintenance schedule, contacts section, laboratory testing section, a section on safety, and appendices. The description of system components section goes into detail about things like pump size and capacities, piping flow rates, control system components, such as controllers, SCADA systems, flow meters, switches, and valves, and pipe/fitting sizes. The operation procedures section provides a how to on system operation, emergency procedures, and information on trouble shooting if problems occur. The contacts section will include contact information for the project engineer, agency representative, construction contractor, controller system representative, well driller, and electrician. The section on safety will include a description of the safety program, safety equipment, mechanical, electrical, fire and chemical hazards, hazardous materials information, hazardous locations (e.g., manholes, chemical rooms), safety reference information, and accident reporting procedures. The appendices usually include the system layout plans, including monitoring wells, points, sumps, etc. locations, the permits for the system, such as State Discharge System (SDS) permit, MSDS sheets, reporting forms, and communication license information.



OPERATIONS AND MAINTENANCE MANUAL

FOR

WASTEWATER TREATMENT FACILITY
SPRAY IRRIGATION SYSTEM

CITY OF

PEQUOT LAKES, MINNESOTA

JANUARY 2018

WSN No. 0130B0059.000

WIDSETH SMITH NOLTING

7804 Industrial Park Road.
P.O. Box 2720
Baxter, MN 56425-2720
Phone: 218-829-5117
Fax: 218-829-2517

5. Scenario C–Example Workplan and Spreadsheet

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

Attachment A

Example Workplan

Project Title: Category C: Closed Landfill Program Environmental Services – Scenario C

1. Project Summary:

A closed, municipal solid waste landfill wants to enter the MPCA's closed landfill program. The landfill is in rural Minnesota near a growing city with sensitive receptors present. A residential development is present within approximately 150 feet of the western border of the landfill with proposed development planned adjacent to the western border. A second residential development is also present within approximately a half mile south of the landfill with a proposed residential development planned between the existing residential neighborhood and the southern border of the landfill. Strange odors have been reported in irrigation wells associated with the residential development to the south. The residential developments are serviced by municipal water and sewer but not all residents were required to connect to city water and some residents still have shallow water wells for irrigation purposes. Approximately a quarter mile east of the landfill is a farm with a private drinking water well that also supplies water to 75 cattle. The farmer also has reported difficulties growing corn from a field located adjacent to the east border of the landfill.

The landfill began as a non-permitted dump in 1965. In 1972 the landfill was permitted by the MPCA for the disposal of municipal solid waste. The landfill footprint covers approximately 30 acres and the volume of waste at the landfill is unknown, however during the operation of the landfill waste was placed within 20 feet of the landfill's west, south, and east boundaries. The landfill was closed in 1983. The existing cover present at the landfill is not adequate as it is rather flat with ponding noticed in many locations and the material used was not consistent (potentially consisting of gravel along the southern border). A limited remedial investigation was conducted after the closure of the landfill and showed volatile organic compounds (VOCs) and metal detections at elevated concentrations, some exceeding health risk limits (HRLs) near the landfill. Three monitoring wells and 20 passive gas vents scattered across the cover make up the environmental monitoring system at the site. However, few monitoring points were installed further away from the site and due to the fact the landfill is beyond its post-closure care period, monitoring in recent years has been inadequate. The site meets the definition of a qualified facility according to the Landfill Cleanup Act. The MPCA Closed Landfill Program is seeking additional information about site conditions before it accepts the landfill into the program and takes over its long-term care. The MPCA Closed Landfill Program is also interested in a long-term remedy for the landfill itself to best protect human health, safety, and the environment

2. Statement of Problems, Opportunities, and Existing Conditions

Problems- Detected levels of VOC's and metals above the health risk limits (HRLs) in the groundwater near the landfill. The landfill was closed in 1983. Monitoring at the landfill has been limited and the potential impact to several receptors located downgradient of the landfill has not been adequately addressed. Current conditions at the landfill need attention. The cover material present is relatively flat and the material used was inconsistent. Potential residential developments are planned adjacent to the west and southern borders where waste has been placed within twenty feet of the landfill boundaries. It is probable that hazardous material has migrated thought the shallow groundwater aquifer as residents located south of the landfill have reported strange odors in their irrigation wells. It is also probable that the presence of landfill gas present beneath the site is affecting the corn east of the landfill. Existing conditions present at the landfill do not allow for a 50-foot setback required at a landfill. The requirements for a 200-foot compliance boundary do not appear to be present at the site as well.

Existing Conditions – The soils present beneath the site are generally glacial till with sand layers intermixed with clay. These soils have the potential to be highly permeable, allowing for contamination to migrate to groundwater and off site. City water and sewer is available to residents located west and south of the landfill but not all residents were required to connect to city water. Sensitive populations are located downgradient of the landfill and strange odors have been reported in wells present south of the landfill. The sand layers within the till may also be allowing the for the horizontal migration of landfill gas in the soil profile.

Opportunities – The city can extend the existing water supply systems to residents not currently connected. The city's comprehensive plan includes residential development on property adjacent to the west and southern border of the landfill and could require that all new development is required to connect to the available city water system.

Assumptions

- Landfills usually produce appreciable amounts of gas within 1 to 3 years. Peak gas production generally occurs within 5 to 7 years after wastes are deposited. Most gas production is within in 20 years after waste is dumped. The landfill has been closed for approximately 35 years and it is anticipated the majority of landfill gas has dissipated. It is still possible small quantities of landfill gas are present at the site. WSN anticipates the production of landfill gas to be in the final stage which is characterized by a long period of methane production and waste degradation as methanogenic microorganisms reach steady state populations and gas constituent concentrations stabilize.
- Soil, gas, and groundwater samples would be processed by the lab at the standard turnaround rate of ten days. Expedited sample processing is available for some analytes and could reduce the time to complete each objective.
- Groundwater contamination at concentrations above the Minnesota Department of Health (MDH) health risk limits (HRLs) do not extend past the 200' compliance boundary.
- The source of the "strange odors" in the irrigation wells reported by a few residents south of the landfill were determined to be naturally occurring (i.e. iron bacteria and/or sulfur bacteria).
- Groundwater beneath the landfill is at a depth of 20 feet and the historical groundwater flow direction is south-southeast.
- All habitable structures in the residential development south of the landfill are connected to the municipal water system.

3. Goals, Objectives, Tasks, and Subtasks

Goal: The owner of the landfill wishes to enter the MPCA's Closed Landfill Program (CLP). A list of requirements must be developed (i.e. Landfill Cleanup Agreement) between the landfill owner and the MPCA. After the Landfill Cleanup Agreement has been satisfied, the owner expects to receive a Notice of Compliance allowing the landfill to enter the CLP.

Objective 1: Perform a remedial investigation.

Task A: *Mitigate the threat to the residential drinking water wells. Contact property owners who have reported odors in their private wells, sample, and analyze. If contaminants are present above applicable standards, provide immediate alternative drinking water source.*

Subtask 1: Prepare a Health and Safety Plan.

Subtask 2: Complete a receptor survey and contact all potentially affected residents with private water wells.

Subtask 3: Obtain the necessary access agreements for drinking water well sample collection.

Subtask 4: Complete SCOF paperwork for state laboratory contractor and state drilling contractor.

Subtask 5: Coordinate sampling of private drinking water wells with affected property owners.

Subtask 6: Mobilize to the site to collect private drinking water well samples, submit to laboratory for analyses. Obtain unique well ID # for private wells to acquire well records to confirm geology and obtain well construction details.

Subtask 7: Report results to the MPCA, property owners, and the city making sure personal contact is made with the property owners who have detections of contaminants above the MDH drinking water standards. Provide all property owners with literature regarding health concerns relative to the contaminants of concern. Provide bottled drinking water to effected well owners until a more permanent solution can be established.

Task B: *Complete soil borings for groundwater investigation. Phase I of the investigation will consist of borings located 50 feet from the landfill as shown on Figure A. Groundwater samples will be collected and analyzed for a suite of metals, general chemistry parameters and volatile organic compounds (VOCs). If the analytical results indicate contamination above the standards, another series of soil borings, Phase II, will be completed as shown on Figure A.*

Subtask 1: Coordinate with drilling contractor to clear utilities.

Subtask 2: Coordinate field work with state drilling contractor, MPCA project manager, and affected property owners.

Subtask 3: Advance Phase I soil borings at the locations indicated on Figure A. Discrete groundwater samples will be collected starting at the groundwater interface and commencing every 10 feet to approximately 60 feet below the groundwater interface.

Subtask 4: Collect continuous soil samples to screen for soil contamination and to classify soils.

Subtask 5: Complete soil boring logs and tables summarizing the data obtained during the investigation.

Subtask 6: Using the data collected during soil boring advancement create accurate cross sections displaying the subsurface geology.

Subtask 7: Review analytical results from the Phase I groundwater samples. If a Phase II investigation is required prepare a work plan for review and comment from the MPCA. Advance an additional series of soil borings at the approximate locations shown on Figure A.

Subtask 8: Further develop the cross sections using subsurface data collected during Phase II of the groundwater investigation.

Subtask 9: Prepare Groundwater Investigation Report.

Task C: *Sample the three existing monitoring wells. Based on the distance between the existing monitoring wells, additional wells are required. Install a minimum of two new wells at the locations shown on Figure A.*

Subtask 1: Contact property owner and coordinate site access.

Subtask 2: Prepare a Monitoring Well Installation Work Plan and submit to the MPCA for comment and approval.

Subtask 3: Coordinate with state contract laboratory and state contract driller.

Subtask 4: Install additional monitoring wells per the approved work plan. Considering the results of the groundwater sampling, nested wells may be required.

Subtask 5: Check static water level in all wells to confirm groundwater elevations and groundwater flow direction. Collect stabilization readings from each well before collecting sample. Collect water samples from each well. Collect two rounds of base line samples from the new wells. Analyze samples for metals and VOCs.

Subtask 6: Collect quality assurance samples (i.e., trip blanks and field blanks).

Subtask 7: Complete letter report summarizing the data obtained during the assessment.

Task D: *Conduct Preliminary Subsurface Assessment for landfill gas. WSN will complete a subsurface assessment outside the footprint of the landfill to determine if methane gas is present. It has been 35 years since the landfill has closed and it is probable that landfill gas production has peaked, however, residual landfill gas may be present at the site. Subsurface assessment will monitor for lateral and vertical pathways where higher permeable soils or fill are present.*

Subtask 1: Contact property owner and coordinate site access.

Subtask 2: Review the results of previous landfill gas sampling of current passive gas sampling points.

Subtask 3: Coordinate with state drilling contractor and state laboratory contractor. Review and update HASP as warranted.

Subtask 4: Using the cross sections developed during the groundwater investigation prepare a work plan showing depths and locations of gas sampling points.

Subtask 5: Install permanent gas monitoring points at the locations shown on Figure A and at depths in accordance with the work plan. Use portable explosimeter and collect preliminary field data. Collect gas samples and analyze for methane. It might be necessary to install the gas sampling points at various depths.

Task E: *Conduct additional gas samples from existing gas sampling points.*

Subtask 1: Coordinate site access with property owners.

Subtask 2: Review results of preliminary subsurface landfill gas assessment and assess the need for additional sampling points.

Subtask 3: Coordinate with MPCA Project Manager and affected property owners.

Subtask 4: Mobilize to the landfill and complete quarterly sampling of the landfill gas sampling points. At least one sampling event must be completed when frost is at maximum depth.

Subtask 5: Prepare report detailing results of landfill gas sampling.

Objective 1 Timeline: Task A, B, C, and D would be completed concurrently over a period of four to six weeks. Task E could commence once laboratory results from the initial landfill gas samples are received, which is expected to be within two weeks after sampling. Per the MPCA Guidelines for Monitoring for Landfill Gas at and Near Former Dumps, landfill gas monitoring should be conducted at least three to four times per year. Consequently, landfill gas sampling for Task E would occur three months after Task D is complete. Development and execution of the landfill gas quarterly monitoring plan could be accomplished within four weeks of MPCA approval.

Objective 1 Deliverables: A detailed report with the results of Tasks A, B, C, and D consisting of monitoring points and related analytical data will be submitted to the MPCA within three weeks of completing the investigation. A letter report detailing the results of Task E and the recommended corrective action would be prepared after each quarterly sampling event.

Objective 2: Assess current landfill cover and design a cover that restricts infiltration by at least 95%.

***Task A**: Investigate current landfill cover and assess the need for an enhanced permanent cover.*

Subtask 1: Coordinate with state contract surveyor, MPCA Project Manager, and property owners.

Subtask 2: Complete a topographic survey of existing landfill conditions.

Subtask 3: Advance a series of soil probes to determine current landfill cover soil type, thickness, and to define the edge of the debris.

Subtask 4: Prepare a report documenting existing landfill conditions.

***Task B:** Prepare Plans and Specifications for an enhanced landfill cover system.*

Subtask 1: Review results of landfill existing conditions and prepare a recommendation for an enhanced landfill cover system.

Subtask 2: Prepare a site grading plan in accordance with all applicable landfill design requirements.

Subtask 3: Submit plans and specifications for the landfill cover to the MPCA for review and comments.

Objective 2 Timeline: Tasks A could be performed during the remedial investigation. Preparation of the plans and specifications would take one week.

Objective 2 Deliverables: Figures detailing existing conditions at the landfill. Plans and Specifications for the design of an enhanced landfill cover system.

Objective 3: Land Use Controls.

***Task A**: Evaluate the need to implement land use controls limiting development of the surrounding property (i.e. private drinking water well installation and building construction) based on the risk identified during the remedial investigation.*

Subtask 1: Review the city's future development plan regarding residential development near the landfill.

Subtask 2: Coordinate a meeting with the MPCA, affected property owners, and the city to further address future development plans. Discussion of a buffer zone should be addressed relative to proposed residential development near the landfill.

Subtask 3: Evaluate the need to require impacted private wells and other private drinking water wells located downgradient and adjacent to the landfill to be connected to the municipal drinking water system.

***Task B:** In accordance with the Minnesota solid waste rules, establish a 200-foot compliance boundary and the 50-foot setback from edge of debris as required by MPCA.*

Subtask 1: Review results of remedial investigation and existing conditions assessments to confirm if a compliance boundary and 50-foot setback are needed for the site.

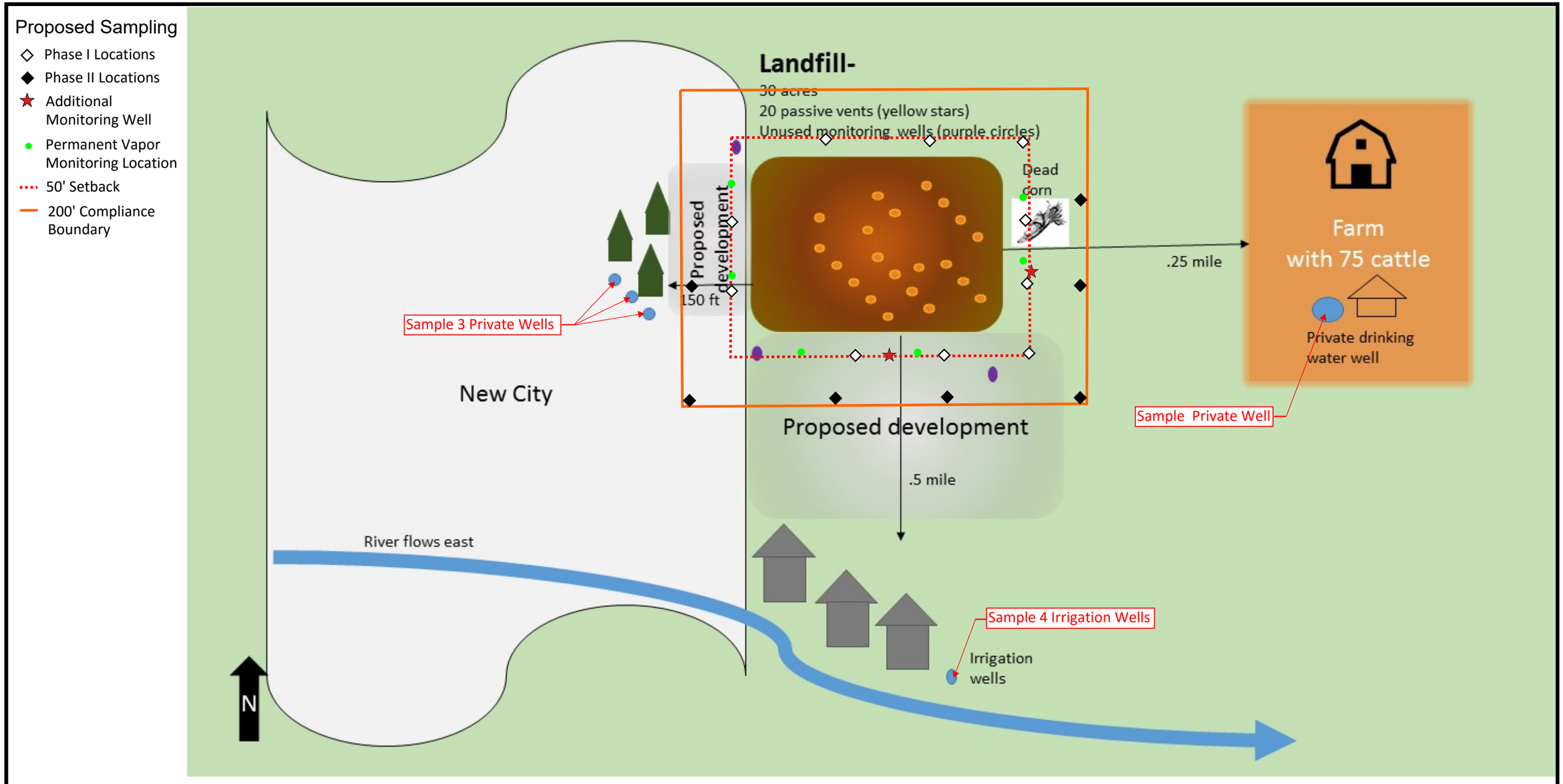
Subtask 2: Initiate a meeting with area property owners, city staff, and the MPCA to discuss 50-foot setback and compliance boundary options.

Subtask 3: If required, coordinate with property owners, city staff, and MPCA to purchase 50 feet of land on all sides of the landfill and 200 feet on the southern (down gradient) boundary to establish the compliance boundary.

Objective 3 Timeline: Tasks A and B could be implemented within two weeks.

Objective 3 Deliverables: Figures detailing existing conditions present at the landfill. Plans and Specifications for the design of the landfill cover system.

Additional Work: Additional soil, soil gas, and groundwater sampling/monitoring may be required to further define the extent of contamination and the potential impacts to human health and the environment. The number and locations of additional borings would be discussed with the MPCA project manager. This additional work may consist of additional borings to define the horizontal and/or vertical extent of contamination on the target property to inform remediation activities. Additional deeper monitoring wells may be required depending on the results of the groundwater investigation and site geology.



NOTE: PROPOSED MONITORING AND SAMPLING LOCATIONS ARE PRELIMINARY. ADDITIONAL BORINGS MAY BE REQUIRED TO CHARACTERIZE THE CONTAMINATION.

WIDSETH SMITH NOLTING

SCALE: NO SCALE

MPCA PROPOSAL
SCENARIO C
CLOSED LANDFILL SITE

PROPOSED SAMPLING PLAN MAP

Date: APRIL 2018

JOB No. PROPOSAL

FIGURE A

MINNESOTA POLLUTION CONTROL AGENCY

520 Lafayette Road North
St. Paul, MN 55155-4194

Attachment B
*Example Scenario Project Spreadsheet

Project title: Category C: Closed Landfill Program Environmental Services - Scenario C

	1. Personnel					2. Subcontracting	3. Equipment			4. Other Expenses			Totals (Extended)
Project Budget	Project Manager	Engineer IV	Scientist I	GIS/CAD Specialist	Field Technician	Drilling Contractor	PID	LEL	Sampling Equipment	State Contract Surveyor	Water Samples	Gas Samples	
	(Hours)	**(Hours)**	**(Hours)**	**(Hours)**	**(Hours)**	**(# of borings)**	**(# of days)**	**(# of days)**	**(# of days)**	**(# of hours)**	**(# of Samples)**	**(# of samples)**	**(Hours)**
*** Objective 1 - Remedial Investigation**													
Task A - Domestic Wells Sampling	6	0	0	8	18	0	0	0	0	0	8	0	32
Task B - Groundwater Investigation	8	0	12	12	80	17	5	0	0	6	102	0	112
Task C - Monitoring Well Sampling/Additional Wells	7	0	8	4	30	2	0	0	3	4	9	0	49
Task D - Preliminary Landfill Gas Assessment	8	0	8	4	18	6	2	2	0	4	0	6	38
Task E - Quarterly Gas Sampling	4	0	10	10	24	0	3	3	3	0	0	18	48
Total for Objective 1 Hrs	**33**	**0**	**38**	**38**	**170**	**23**	**10**	**5**	**6**	**14**	**119**	**24**	**279**
Objective 2 - Design Landfill Cover													
Task A - Investigate Existing Conditions	4	6	4	8	20	16	0	0	0	12	0	0	42
Task B - Prepare Plans and Specifications	10	12	6	16	0	0	0	0	0	0	0	0	44
Total for Objective 2 Hrs	**14**	**18**	**10**	**24**	**20**	**16**	**0**	**0**	**0**	**12**	**0**	**0**	**86**
Objective 3 - Land Use Controls													
Task A - Evaluate need for Land Use Controls	7	0	4	0	0	0	0	0	0	0	0	0	11
Task B - Establish 50' Setback and Compliance Boundary	3	0	6	4	0	0	0	0	0	0	0	0	13
Total for Objective 2 Hrs	**10**	**0**	**10**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**

	Project Manager	Engineer IV	Scientist I	GIS/CAD Specialist	Field Technician	Drilling Contractor	PID	LEL	Sampling Equipment	State Contract Surveyor	Water Samples	Gas Samples	
	(Hours)	**(Hours)**	**(Hours)**	**(Hours)**	**(Hours)**	**(# of borings)**	**(# of days)**	**(# of days)**	**(# of days)**	**(# of hours)**	**(# of Samples)**	**(# of samples)**	
Total Project Hours	**57**	**18**	**58**	**66**	**190**	39	10	5	6	26	119	24	**389**

WIDSETH SMITH NOLTING

Engineering | Architecture
Surveying | Environmental

Brainerd Office
7804 Industrial Park Rd.
Baxter, MN 56425
218.829.5117

Brian A. Ross, PG, VP
Project Manager | Scientist II
218.316.3628
Brian.Ross@wsn.us.com

WSN Office Locations
Alexandria
Bemidji
Brainerd/Baxter
Crookston
East Grand Forks
Forest Lake
Grand Forks
Rochester

WidsethSmithNolting.com