# TECHNICAL PROPOSAL

# CATEGORY C: CLOSED LANDFILL PROGRAM

**PROPOSAL DATE: APRIL 11, 2018**

**PREPARED FOR**

**MINNESOTA POLLUTION CONTROL AGENCY**
**520 LAFAYETTE ROAD**
**ST. PAUL, MN 55155-4194**

**PREPARED BY**

**NOVA CONSULTING GROUP, INC.**
**1107 HAZELTINE BLVD**
**CHASKA, MN 55318**
**952-448-9393**

NOVA CONSULTING

*Leaders in Environmental and Engineering Services*

# TABLE OF CONTENTS



APPENDICES

## 1. COVER LETTER

April 11, 2018

MPCA / CLP
520 Lafayette Road North
St. Paul, MN 55155

**RE: Minnesota Pollution Control Agency – Remediation Master Contract**
**Category C. Closed Landfill Program Only Environmental Services**

Dear Sir or Madame:

Nova Consulting Group, Inc. (Nova) appreciates the opportunity to be considered for the Minnesota Pollution Control Agency's Remediation Master Contract. Enclosed is Nova Consulting Group, Inc.'s (Nova) submittal for consideration of the Category C. Closed Landfill contract.

Nova is a multidisciplinary consulting firm providing services in the areas of environmental management, compliance, and investigation services for more than 30 years.

Environmental Concepts & Design, Inc. (ECAD) is an environmental consulting and engineering company based in St. Paul, Minnesota. ECAD was established in 1996 and has extensive active landfill knowledge, including long-term investigations, remediation and design.

Nova and Environmental Concepts & Design, Inc. (ECAD Engineering) are under common ownership and control and is submitting this proposal under Nova. Combining personnel has allowed us to establish an elite network of independent professionals. To simplify this proposal process, most language this proposal and all contract documents will be managed as Nova.

Nova currently employs over 139 on-staff professionals in 17 regional office locations, including nearly 40 persons in our headquarters located in Chaska, MN and three people in St. Paul devoted primarily to landfill work. Nova has concentrated on developing a well-balanced technical staff with education and training in a broad range of environmental and scientific disciplines.

Nova's environmental staff receives continuous training to stay up-to-date on best management practices for site investigation tasks including sample collection and field documentation for groundwater, soil, surface water, sediment, soil vapor and ambient air. The staff follows the appropriate Minnesota Pollution Control Agency (MPCA) Guidance Documents from project inception through reporting to ensure that the field tasks satisfy the MPCA requirements.

Nova formally accepts the classification levels and hourly rates as presented in the Rate Schedule 1 and Rate Schedule 2 tables as well as the Equipment and Supplies pricing included in the request for proposal document.

Terry Kaiser, with over 20 years of landfill investigation and engineering experience, will provide technical assistance and oversight for the projects, as needed. Terry is our Landfill Construction Services Group Leader, and manager of our satellite office location at 905 Jefferson Avenue, Suite 210, St. Paul, MN 55102.

Mr. Mark Perry, Vice President and Leader of the environmental Assessment and Remediation Group, will represent Nova and will be readily available to answer inquiries regarding project organization, billing and invoicing and general project-related information and can be contacted via phone at (612) 275-1997 or email (mark.perry@novaconsulting.com).

For more information about Nova's capabilities and office locations, please peruse our website at: www.novaconsulting.com. We look forward to working with your staff on these important projects.

Sincerely,

Mark Perry
Vice President- Corporate Regional Manager

# 2. QUALIFICATIONS AND CAPABILITIES

## 2.1 SUMMARY OF CAPABILITIES, EXPERIENCE AND ORGANIZATIONAL STRUCTURE

Incorporated in Minnesota in 1987, Nova has proudly become one of the largest privately held environmental consulting firms in the Upper Midwest. For more than 30 years, Nova has provided a variety of environmental consulting services. The following information provides detailed descriptions of the services Nova provides as they relate to this RFP.

## 2.2 LANDFILL ENGINEERING

Nova recently extended its line of services to include Landfill construction services, by uniting with an engineering firm under common ownership. The Landfill Construction Services Group is led by Terry Kaiser, PG, PE, CGWP.

The following landfill construction services and scopes of work have been added to Nova's areas of expertise:

- Landfill construction proposal development & bid support for Landfill leachate management, final cover construction, MSW clay liner, and C&D Liners.
- Landfill construction management providing on-site, on-call, observation and documentation of contractor and subcontractor work; design subgrade verification, clay compaction testing and oversight; HDPE & LLDPE liner subcontractor management and project management for bid quantities versus actual materials used and client payment recommendations.
- Landfill construction certification for MSW and C&D permitted landfills, including certification of As-builts, documentation of construction records, and communication with regulatory staff for preliminary certifications.
- Landfill engineering feasibility studies for waste management, leachate management systems & controls, leachate disposal systems; including assisting in evaluation and permitting for Case-specific Beneficial Use Determination (CSBUD) or Demonstration/Research Projects (DRPs).

## 2.3 LANDFILL REGULATORY MANAGEMENT

Nova's extended service line & staff now includes significant knowledge of Solid Waste permitting, along with associated Leachate permit management issues for both private and public landfills.

Nova has experience with preparing Solid Waste Permit applications including Environmental Assessment Worksheets, leachate management permitting, and calculation of financial assurance cost estimates. Nova also has extensive knowledge with landfill operations and has provided operators with effective sampling and analysis plans, operations and maintenance manuals and corrective action remediation reviews; and routine regulatory reporting of operations including quarterly and annual reporting requirements for groundwater, leachate and landfill gas, and other regulatory data delivery for environmental monitoring programs.

## 2.4 LANDFILL INVESTIGATION & REMEDIATION

With the additional capacity provided by Nova's Environmental Assessment and Remediation division, Nova is excited to provide greater capacity for Landfill-oriented investigation and remediation services. Nova has proficiency in landfill investigations of groundwater plumes including vertical and horizontal groundwater contaminant delineations as well as routine and corrective action sampling for soil, landfill gas, and groundwater. Nova has conducted cover integrity inspections and has provided development and oversight of pilot study programs, corrective actions, and additional controls including soil vapor extraction systems as needed.

## 2.5 PHASE II INVESTIGATION AND REMEDIATION:

Nova's staff of Professional Geologists (P.G.), Professional Engineers (P.E.) and experienced Staff Scientists conduct Phase II Subsurface Soil and Groundwater Investigations related to potential petroleum, chlorinated solvent and other contaminants of concern. Where possible, Nova utilizes its own Geoprobe® hydraulic sampling probe, and a network of certified analytical laboratories to obtain the appropriate data in assessing the need for regulatory compliance reporting and/or remediation. If necessary, Nova is experienced and skilled in selecting, designing and implementing/installing various remediation technologies including: soil excavation and off-site disposition or on-site re-use, passive subsurface vapor barrier/ventilation systems, air sparging and soil vapor extraction, and ground water pump and treatment and free product recovery systems. Nova's history of national investigation and cleanup experience has resulted in a thorough and complete knowledge of state and federal guidelines with respect to environmental compliance.

As part of our environmental remediation work, Nova staff has experience utilizing a variety of specialized monitoring equipment including photoionization detectors (PIDs), flame-ionization detectors (FIDs), Lumex® mercury vapor analyzer, Geoprobe® hydraulic sampling units, combustible gas meters, submersible and peristaltic pumps, pressure transducers, aquifer parameter meters and more. Nova staff has experience employing a variety of soil remediation techniques including thermal incineration, landfarming, landfill disposal, soil venting, vegetative remediation, and on-site bioremediation. Groundwater remediation technology experience includes groundwater recovery and aeration, air sparging, recovery well vacuum enhancement, enhanced bioremediation through chemical injections, and natural bioremediation monitoring.

Nova is capable of creating project specific Electronic Data Deliverables (EDDs) utilizing specialized and open-source software packages, including ArcMap, Quantum GIS (open-source), PostgreSQL (open-source, open spatial database). These programs allow Nova to evaluate groundwater flow directions and gradients, illustrate contaminant plume concentrations and vertical profiles, prepare datasheets for Quality Assurance/Quality Control (QA/QC) review, automatically generate routine Quarterly/Annually environmental quality summary reports, and submit EDDs, including producing EQuiS-specific data deliverables.

For more than 20 years, Nova Consulting Group, Inc. has provided subsurface soil, soil vapor and groundwater sampling services to its clients on more than 1000 project sites using hydraulic direct-

push probing/drilling applications. Nova currently employs the use of a truck-mounted 5410 Geoprobe® and a truck-mounted 5400 Geoprobe® utilizing Macro-Core, dual tube, and large bore sampling technologies. Nova's equipment is used for discrete and continuous soil sampling, temporary discrete groundwater sampling, temporary and permanent vapor point installation and sampling, sub-slab vapor point installations, and pilot tests.

## 2.6 STAFF MATRIX TABLE

The following is a summary of staff, classification, OSHA certification status (29 CFR 1910.120, 40-hour and subsequent 8-hour refresher courses), years of service with Nova, education, work experience, licenses/certifications and location of personnel that may be assigned to the Contract. Individual resumes outlining specific qualifications, licenses/certifications, professional development and experience are included in Appendix A.

| Staff | Classification | OSHA Cert (Y/N) | Years of Service at Nova | Education | Years of Environmental / Engineering / Remediation Experience | Licenses/ Certifications | Location |
|---|---|---|---|---|---|---|---|
| Mark Perry | Project Manager | Y | 15 | B.S. Earth Science - Geology | 25 | Asbestos Building Inspector (BI) | Local |
| Terry Kaiser | Engineer 4 | Y | 1 | B.S Geo-Engineer | 30 | P.E. (MN) P.G. (MN) SWPPP Design (MN) CGWP (NGWA) | Local |
| Elise Steger | Project Manager | Y | 1 | B.S. Geology | 23 | P.G. (MN), MDH Asbestos Inspector | Local |
| Brian Hoese | Project Manager | Y | 2 | B.S. Biosystems & Agricultural Engineering | 13 | P.E. (MN) | Local |
| Eric Xanderson | Project Manager | Y | 1 | B.A. Geology | 10 | Stormwater Management Certification | Local |
| John Bale | Engineer 2 | Y | 5 | B.S. Mechanical Engineering | 20 | P.E. (MN, WI) | Local |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mike Hayes | Scientist 2 | Y | 11 | B.S. Geology | 23 | P.G. (MN, FL, PA, WA, WI), Asbestos BI | Local |
| Eric Halpaus | Scientist 2 | Y | 21 | B.S. Geology | 21 | Licensed Well Driller (MN) | Local |
| Chuck Easley | Scientist 2 | Y | 28 | B.S. Natural Sciences | 28 | CHMM, Asbestos BI, MP, Site Supervisor, Certified Radon Measurement Professional, | Local |
| Anne Sinna | Scientist 2 | Y | 18 | B.A. Biology and Environmental Studies | 18 | Asbestos BI, MP, Radon Measurement Professional | Local |
| Brian Novotny | Scientist 2 | Y | 9 | B.S. Hydrology and Water Chemistry | 21 | Asbestos BI | Local |
| Andy York | Scientist 1 | Y | 8 | B.A. Geology | 10 | Asbestos BI, MP, Site Supervisor, Certified Radon Measurement Professional, | Local |
| Maegan Dunn | Scientist 1 | Y | 7 | B.S. Environmental Science | 11 | Asbestos BI, Contractor/ Supervisor, | Local |
| Nicholas J. Domeier | GIS/CADD Specialist | Y | 1 | AAS Civil Engineering Technology | 1 | Civil 3D AutoCAD/ QGIS | Local |

BI – Minnesota Department of Health (MDH) Licensed Asbestos Building Inspector, MP – MDH Licensed Asbestos Management Planner

## 2.7 FIRM LOCATIONS AND HEADQUARTERS

Nova currently employs over 139 on-staff professionals in 17 regional office locations, including nearly 40 persons in our headquarters located at 1107 Hazeltine Boulevard, Suite 400, Chaska, MN 55379. A map of the office locations is included in Appendix B.

## 2.8 KNOWLEDGE OF MPCA GUIDANCE DOCUMENTS

As pertinent to the focus of a landfill investigation, remediation or closure, Nova provides professionals who prepare work plans, sample analysis plans, permitting documents, engineering designs and other deliverables as prescribed by House Rules for 7035 Solid Waste along with these guidance documents:

Landfill Engineering:

- Guidance for Leachate Recirculation at Municipal Solid Waste Landfills
- Guidance for Liner Design for Demolition Debris or Industrial Solid Waste Landfills
- Guidance for Soil Construction Standards and Testing Frequencies–Landfill Cell Construction
- Guidance for Soil Construction Standards and Testing Frequencies - Final Cover Construction
- Land Application of Landfill Leachate
- Guidelines - Land application of by-product limes
- Landfill Slope Guidance
- Regulated Fill

Environmental Monitoring:

- Laboratory achievable reporting limits 102715 (w-sw3-58.xls)
- Sampling and Analysis Plan Guidance
- EQuiS-specific data delivery

Permitting:

- Solid waste facilities A guide to Minnesota's Industrial Stormwater Permit
- Alternate Daily Cover Spray-on Cover Materials
- Demolition Landfill Guidance
- Guidance for Industrial Waste Management Evaluation Model (IWEM)
- Industrial Landfill Guidance Manual
- MPCA Generic Template Industrial Solid Waste Management Plan (ISWMP) for Demolition and Construction Landfills
- Solid Waste Disposal
- Solid Waste Financial Assurance
- Alternative Leachate Management

Closed Landfill Program:

- Land Use Planning
- MPCA Closed Landfill Program Solar Initiative
- Sampling Protocol for Monitoring Wells

Nova also manages and continually reviews MPCA regulatory cleanup guidance documents as the fundamental model for investigation and cleanup plans. Nova routinely refers to, uses and understands the following guidance documents:

- Petroleum Remediation Program Guidance Documents for Underground Storage Tank (UST) and Aboveground Storage Tanks
    - Including all policies and procedures, worksheets, applications and report forms for general guidance, release reporting, site investigation and risk evaluation, and corrective actions.
    - Green and Sustainable Remediation
- Vapor Intrusion Best Management Practices (BMPs)
- Intrusion Screening Values (ISVs)
- Remediation Division Guidance and Policies
    - Soil Leaching Values (SLV) Guidance and Corrective Action Design (CAD) for Superfund, Resource Conservation and Recovery Act (RCRA) and Voluntary Investigation and Cleanup (VIC) programs.
    - Carcinogenic Polynuclear Aromatic Hydrocarbon (cPAH) Policy
- Managing Petroleum Contaminated Soil at Public Works Projects
- Spill Response Preparedness and Spill and Incident Reporting and Response
- Soil Treatment and Disposal Guidance documents
    - Mercury-contaminated soils in Minnesota Landfills
    - Regulated and Unregulated Fill BMPs and policies
- Brownfield Redevelopment Project Guidance
    - Response Action Plans (RAPs)
    - Investigation and Remediation of Asbestos Containing Wastes
    - Phase I and II Investigation work plans and reporting
    - Legal Documentation
        - Affidavit Concerning Real Property Contaminated with Hazardous Substances
        - Environmental Covenant and Easements
        - Consent of Mortgage Form

Nova has not been involved with projects involving infectious disease, but is aware of the infectious disease preparedness and response guidance associated with the decontamination of buildings infected with the Ebola virus.

Nova has worked with the MPCA Petroleum Remediation program since its inception in 1987 and has maintained its Petrofund Consultant Registration for over 25 years. In addition, Nova currently possesses contracts/master services agreements and/or has provided services on a project contract basis to the following entities:

- U.S. General Services Administration (GSA)
- Minnesota Department of Transportation (MNDOT)
- State of Minnesota – Department of Administration (Real Estate and Construction Services)
- Hennepin County
- Anoka County
- Dakota County
- Carver County

Nova's government agency services primarily include: MSW & C&D Landfill Construction, Landfill Permit Compliance, Landfill Permitting & Compliance, Landfill Corrective Action Investigation & Environmental Reporting, Phase I Environmental Site Assessments (ESAs), Phase II Subsurface Investigations, Underground Storage Tank (UST) Removal Oversight/Sampling and Compliance, Asbestos & Hazardous Materials Surveys, Asbestos Abatement Coordination/Air Monitoring, Lead-Based Paint Inspection & Risk Assessments and other various industrial hygiene services (i.e. indoor air quality and mold).

Nova has performed multiple remedial investigations, landfill closures, lined & unlined construction, and Nova has completed more than 40 limited site investigations (LSI's) and more than 15 remedial investigations (RI's) within the State of Minnesota in the last five years.

Nova was incorporated in 1987, and since its inception, has provided services to various government and business clients in accordance with the MPCA Petroleum Remediation Program's Consultant Guidance Documents. Throughout its business history, Nova has maintained a Department of Commerce Petroleum Tank Release Compensation Fund (Petrofund) registration, and continually updated its internal investigative methodologies to adhere to the evolving MPCA guidance policies (including voluntary cleanup programs) and Petrofund rules. Nova's Landfill Engineering and Environmental Assessment and Remediation (EAR) staff have over 200 combined years of experience in assessment, investigation and cleanup services related to engineering and environmental management.

## 3. PROJECT DESCRIPTIONS

A) Project Example: 2015 Groundwater Plume Investigation

1) Client: Jeff Bredberg, Kandiyohi County Landfill 320-231-6229 (x 5258)

2) Site Description:

Site is a permitted MSW landfill located 11 miles north of Willmar, Minnesota. It is on the eastern edge of the Alexandria Moraine Complex. Glacial drift approximately 400 feet thick overlies bedrock in this area.

The western portion of the site is generally located in the Lake Florida Watershed, which is a sub-watershed of the Chippewa Watershed. The eastern portion of the site is generally located in the Nest Lake Watershed, which is a sub-watershed of the Middle Fork Crow River Watershed. The site is located over a local groundwater divide and in a recharge zone.

The site began accepting municipal solid waste in 1969. The 1972 permitted area consisted of 80 acres. Kandiyohi County purchased the land from the City of Willmar in 1987 to continue waste disposal activities.

Efforts to separate demolition material (demo) from mixed municipal solid waste (MSW) began in 1990. The separated demo waste was placed along the east and south sides of the unlined Phase I MSW fill area. That demolition fill area reached its permitted capacity in mid-1997 and has since been capped. A separate construction and demolition (C & D) waste fill area was developed and permitted south of the MSW fill area in 1997, and is still open today.

Review of Kandiyohi County and MPCA historical documents have revealed a potential disposal of approximately 50,000 gallons of paint sludge and 8,482 cubic yards of toxic material in the Old Phase 1 Disposal Area from 1970 to 1980 (ECAD, 2009).

The groundwater compliance standards for the site are contained within operating permit SW-079. In general, they include maintaining chemical concentrations below permitted Intervention Limits at the compliance boundary and maintaining chemical concentrations below the Health Risk Limits at the property boundary. The potentiometric levels in the Lower Outwash Sand typically differ by a few inches from what is observed in the Upper Outwash sands at nested wells. This indicates that a vertical gradient is present. The vertical gradient tends to be down in the north end of the site and up at the south end. The primary area of concern, Old Phase 1, is mostly in the north end.

3) Project Description:

Installation and monitoring of three groundwater wells at the leading edge of a vinyl chloride groundwater plume at Kandiyohi County Landfill. A Work Plan for the project was approved by MPCA hydrogeologist Mark Rys. The wells were installed in December 2014, followed by background

monitoring and reporting in 2015. This was part of an on-going remedial investigation for the Kandiyohi County Landfill. We continue to provide landfill engineering and remedial investigations services as under Nova ownership.

Key personnel with Nova include Terry Kaiser and Eric Xanderson (nee Sanderson). Mr. Kaiser was instrumental in evaluating groundwater flow conditions from the investigation. Mr. Xanderson provided 3-dimensional reviews and presentations, illustrating horizontal and vertical plume limits, soil boring profiles and historical buried waste timelines & topography, documented through the prior year's extensive empirical sampling data obtained from corrective action investigations 2009-2013 (ECAD, 2009, ECAD 2010; ECAD 2011; ECAD 2012; ECAD 2013) to aid stakeholder understanding. Presentation and data were collected using non- proprietary data evaluation, management and illustration techniques. A video of the presentation is available at: http://ecadengineering.com/#video

The final groundwater investigation report presents the work completed to install and monitor the plume's leading edge using three (3) groundwater monitoring wells (MW27, MW29B, & MW30). A significant issue encountered during installation and background monitoring was the hydraulic artesian conditions at MW30 and properly designing and sealing adjacent borings. The boring required a 10-foot long wooden plug, topped with a large concrete stone as performed by a certified well driller; the well required a plug, with additional blocking, to keep sealed during winter. Other work completed included standard evaluations of aquifer characteristics from hydraulic conductivity tests, grain size analysis soil sample tests, and water level measurements from over 30 wells in and around the site, and three surface water features.

Before locating, delineating and monitoring the leading edge of the plume, remedial investigation work included:

**Source Investigation**

On-site work included a pilot test for soil vapor and active gas extraction; waste & vapor screening with PID; environmental gas monitoring; groundwater sample collection at base of fill; and delineating two separate sources of landfill contamination. The work and reporting was primarily focused on potential source remediation options with cost estimates for potential remedial actions including:

- Soil & Vapor Extraction
- Source Relocation
- Active Landfill Gas Venting
- Air Sparging
- Groundwater Pump and Treat
- Permeable Reactive Barrier
- Continue groundwater monitoring, and notify property owners, regulators, and local well drillers of the inferred plume limits.

Based on the review of the remedial source investigation, if a significant threat to human health and the environment was observed, it appeared that the relocation option would be the most cost-effective approach to remediation, with costs ranging from 3 to 4 million dollars. Because of the remedial investigation review, including preliminary plume delineation results discussed in the next section, regulators determined that the existing lined landfill could continue a proposed vertical development on the eastern flank of the closed unlined landfill, which continues the permitted life of the landfill.

**Horizontal and Vertical Plume Delineation**

Following the source area investigation, 27 Rotosonic Borings (RS) were completed over a 3-year period. Rotosonic drilling was selected because it was capable of drilling using only clean potable water and vibratory drilling. An additional benefit to rotosonic included whole-section coring, allowing soils in boring to be confidently evaluated at 1-foot increments. A temporary monitoring well was placed in boring, then vibrated into place. Water, at least 3x what was used for drilling, was then evacuated. Groundwater samples were in this manner collected at 5-foot vertical intervals and analyzed on-site by a mobile lab.

Continuous communication between field staff, office staff and MPCA Hydrogeologist of record assured stakeholders of sufficient confidence in the selected delineation locations and sample results, to assure client that additional costs to mobilization were reduced and/or eliminated. These RS borings provided significant confidence to the understanding of the aquifer's contaminant transport mode using empirical results at discrete intervals in the aquifer. Significant pathways were identified, *in situ*, and the multiple potential aquifer pathways, including aquitards, helped engineers and regulators identify the maximally protective groundwater monitoring system.

The summary of remedial design & investigation from 2009-2015 includes:

- Final Cover placed in 1995 stopped significant source area releases of contamination into the groundwater;
- The leading edge of the groundwater plume had migrated approximately 1 mile from the landfill in 2017.
- Two portions of the permitted landfill contained elevated concentrations of VOCs;
- Low concentrations of VOCs were observed in the groundwater beneath the landfill;
- High concentrations of Vinyl chloride, exceeding Intervention limits and Health Risk Limits, in the groundwater had migrated away from the landfill's monitoring system and was approximately 2,000 feet downgradient from the landfill.
- A groundwater monitoring system designed and installed according to the observed empirical concentrations *and* aquifer characteristics to effectively monitor natural attenuation for the foreseeable future.

4) Subcontracted tasks included:

- Laboratory Field Chemical analysis by ECCS;
- Soil testing by SET;
- Field Survey by Bonnema survey;
- Rotosonic Drilling & Monitoring Well Installation by Traut Wells; and
- Boring and Monitoring Well installation by Glacial Ridge Drilling

5) Ongoing corrective actions include annual regulatory notifications to Kandiyohi County housing and development authorities with inferred plume limits to request review of proposed developments that might lead to groundwater use changes in the area; groundwater monitoring & reporting of plume conditions two times per year to Mark Rys of the MPCA, and Kandiyohi County. A site well survey is completed annually to identify any new or potential developments which may impact risk assessment data, within the ½ mile plume boundary. Data reported since 1999 indicates natural attenuation of contaminants of concern from the landfill appears to be improving groundwater quality after closure completion of the unlined space in 1995 with final cover. A 500-foot buffer around the inferred plume limits was established. Impacted land owners, local well drillers, the Minnesota Department of Health (MDH), and the MPCA were notified of the boundary locations. Well drillers were also informed that any well drilling, or soil borings in that area, may need special considerations including MPCA, or MDH approval.

B) Project Example 2014 Leachate Seep

1) Client: Jeff Bredberg, Kandiyohi County Landfill 320-231-6229 (x 5258).

2) Site Description:

Site is a permitted MSW landfill located 11 miles north of Willmar, Minnesota. It is on the eastern edge of the Alexandria Moraine Complex. Glacial drift approximately 400 feet thick overlies bedrock in this area.

The western portion of the site is generally located in the Lake Florida Watershed, which is a sub-watershed of the Chippewa Watershed. The eastern portion of the site is generally located in the Nest Lake Watershed, which is a sub-watershed of the Middle Fork Crow River Watershed. The site is located over a local groundwater divide and in a recharge zone.

The site began accepting municipal solid waste in 1969. The 1972 permitted area consisted of 80 acres. Kandiyohi County purchased the land from the City of Willmar in 1987 to continue waste disposal activities.

Efforts to separate demolition material (demo) from mixed municipal solid waste (MSW) began in 1990. The separated demo waste was placed along the east and south sides of the unlined Phase I MSW fill area. That demolition fill area reached its permitted capacity in mid-1997 and has since

been capped. A separate construction and demolition (C & D) waste fill area was developed and permitted south of the MSW fill area in 1997, and is still open today.

Review of Kandiyohi County and MPCA historical documents have revealed a potential disposal of approximately 50,000 gallons of Paint Sludge and 8,482 cubic yards of Toxic Material in the Old Phase 1 Disposal Area from 1970 to 1980 (ECAD, 2009).

The groundwater compliance standards for the site are contained within operating permit SW-079. In general, they include maintaining chemical concentrations below permitted Intervention Limits at the compliance boundary and maintaining chemical concentrations below the Health Risk Limits at the property boundary. The potentiometric levels in the Lower Outwash Sand typically differ by a few inches from what is observed in the Upper Outwash sands at nested wells. This indicates that a vertical gradient is present. The vertical gradient tends to be down in the north end of the site and up at the south end. The primary area of concern, Old Phase 1, is mostly in the north end.

3) Project Description:

On May 20, 2014, landfill operator Tim Geer notified Terry Kaiser that a potential leachate seep was observed on the south slope a closed portion of the MSW landfill area. Mr. Kaiser prepared and implemented a Work Plan, approved by MPCA engineer Tony Bello, to investigate the cause of the seep. Key personnel at Nova included Terry Kaiser and Eric Xanderson.

Work plan was prepared & executed in accordance with Minnesota Pollution Control Agency (MPCA) reporting requirements of the SW-79 permit, MPCA Solid Waste Management Rules, Part 7035.2615 for contingency action, and the facility's approved Contingency Action Plan.

Under our observation, local contractor Swenson & Son's was hired to excavate the liquid seep for inspection. Two trenches were excavated. The first went through the seep area, the second ran perpendicular to the final cover limit, up the hill from the observed seep.

Excavation required a smooth nosed bucket. Soil excavated was stockpiled on top of a plastic sheet, covered with plastic, and tested for volatile organic compounds (VOCs) using head space procedures and a photoionization detector (PID).

The second trench encountered the final cover's flexible membrane liner (FML) cap at approximately 5-feet below existing grade. During excavation, sections of the FML cap was torn by the backhoe, due in part to confined space entry limitations that restricted access into the trench for more careful hand digging to expose the FML at that time.

The backhoe operator opened the trench more to eliminate vertical wall issues for access. Mr. Kaiser entered the excavation and looked-for signs of leachate contamination. Inside the bottom of the 4-inch drain tube, a brown leachate like stain was observed. The inside of the tube also had a leachate like odor, but no liquid was present. Terry Kaiser notified MPCA Engineering Specialist Tony Bello of these findings via voice mail on that day.

The torn sections of FML cap was patched and sealed by Canamer Services. All repairs were documented, which included photographs and GPS locations. Observation made by Mr. Kaiser indicated that no "burn-outs" were present from the patch, and it looked good and tight.

Two temporary monitoring points were installed. One (PZH5) was installed in the most likely contaminant pathway, a 1-foot layer of saturated gravel observed in the first trench. The other (PZPH5) was installed on in the 4" toe-drain pipe at the toe of the final cover limit in the granular drainage material on top of the existing cap.

Mr. Xanderson monitored the liquid observed in the saturated gravel layer at PZH5 for VOCs. The water level was measured down from the top of casing (TOC) prior to sampling. It was about 6 inches deep at the bottom of the 10-foot deep piezometer. An environmental sample was collected and submitted for laboratory analysis according to the facility's Sample Analysis Plan and Quality Assurance and Quality Control Plans. Results were analyzed for comparison with existing leachate quality to differentiate leachate contamination characteristics from stormwater seepage.

Mr. Kaiser discussed site conditions with the landfill operator, Tim Geer. We brain-stormed a bit, and wondered if the seep could be runoff from the open garbage area next to the interim final cover limits. If spring melt ponding drained into the sand drainage layer on top of the existing final cover, it could end up running off the final cover and seep out the side slopes. Tim said he thought enough ponding could have occurred inside active fill areas to allow leachate to runoff into the drainage layer at interim final cover limits. A clear source of the seep was not identified.

Temporary sampling locations PZH5 and PZPH5 were then continually monitored at least twice a year, along with stormwater outlets downstream of the seepage, for any liquids available to sample. No liquids or observable contaminants were identified from monitoring 2015-2017. No sheens on down-stream stormwater, or characteristic odors were observed.

Remedial action included the following:

- Routine monitoring of the two temporary monitoring points installed.
- Operators increase inspections during spring melt, and stormwater runoff conditions, that could lead to leachate migration outside of active fill areas. Potential problems will be more likely documented and reported to the engineer and owner.
- Additional stormwater management controls are setup to prevent such conditions from occurring, when observed, or anticipated.
- Operators and environmental monitoring professionals routinely watch for leachate seeps along the entire length of the south slope. They are also aware of other potential discharge points and watch for seeps regularly.

4) Excavation of trenches, installation of the temporary monitoring wells and the chemical analysis were subcontracted.

5) Temporary monitoring points closure was approved by MPCA engineer Anthony Bello, 3/8/18.

# 4. SCOPE OF SERVICES FOR CATEGORY C: CLOSED LANDFILL PROGRAM ENVIRONMENTAL SERVICES

## 4.1 COMPANY EXPERIENCE

Below is a description of Nova's scope of services as they relate to environmental services required by the Closed Landfill program

## 4.2 PREPARE HEALTH AND SAFETY PLANS (HASP)

Prior to site visits and/or conducting any proposed work, Nova will prepare a Site Health and Safety Plan (SHSP). The Nova project manager will review the SHSP with Nova personnel prior to initiation of the on-site work and go over any potential hazards. The SHSP will define the procedures and responsibilities to implement on-site safety during the proposed work. The SHSP will be onsite during all field activities and will include the following:

- Potential contaminants that may be encountered during field activities;
- Implementation of safe work practices and establishment of associated activity zones;
- Level of personal protective equipment (PPE) required at the jobsite and PPE upgrading requirements; and,
- Emergency procedures and response protocols.

## 4.3 ENVIRONMENTAL ENGINEERING & REMEDIATION FOR LANDFILLS

Nova has designed and engineered remediation systems for contaminated subsurface media, including, but not limited to, soil, solid waste, groundwater, methane, and/or other vapor. Nova has designed final covers, pilot tests, proposals & specifications, landfill liners, leachate management systems and SWPPPs.

### 4.3.1 Oversee Bench Scale Lab Treatability Studies and Pilot Test/Field Demos:

Nova can provide oversight during bench scale lab treatability studies and pilot test field demonstrations and evaluate potential remedial technologies and support the selection of the optimal remedy to meet the needs of the individual project. Corrective action design documents production, including CAD, GIS, as-builts, pilot tests, installation certification, monitoring and notifications.

### 4.3.2 Evaluate the Need for, and Oversee, the Implementation of Alternative Drinking Water:

Once the initial site investigation activities are completed, Nova will review the accumulated data. If the investigation field data indicates the potential for impacts to the drinking water supply, Nova would work with the appropriate government agency or agencies to provide an alternate drinking water source or installation of a point-of-use filtration system.

4.3.3 **Preparation and evaluation of bid documents suitable for advertisement:**

Nova can prepare and evaluate documents for bidding, including but not limited to, landfill cover systems, remediation systems, landfill gas systems and erosion repair projects, which comply with regulatory guidance and best management practices.

4.3.4 **Oversee Hydrogeologic Investigations Including Fate and Transport Modeling:**

Nova staff has staff experienced in hydrogeologic investigations including P.G.s and an Environmental Data Specialist, whom are all experienced in analyzing the accumulated field data and have experience in oversight of fate and transport modeling, surface water, groundwater, hydrodynamics and capture zone modeling.

4.3.5 **Capture Zone Modeling:**

See previous section.

4.3.6 **Modelling for surface water, ground water, and hydrodynamics.**

See previous sections

4.3.7 **Research, evaluation and implementation of innovative or new technologies as applicable.**

Nova staff has experience in evaluating and implementing new technologies for leachate treatment and management, landfill liner, final cover, groundwater investigation techniques, water remediation technologies; and rotosonic well abandonment and reconstruction.

4.3.8 **Prepare and Determine if the Stormwater Pollution Prevention Plans (SWPPP) is being followed and make recommendations if revisions are needed during the life of the construction project.**

Nova staff can prepare SWPPPs and ensure they are being followed through by completing site inspections, reviewing contractor inspections if applicable, and attend tail-gate meetings as needed to train on-site contractors on the SWPPP's Best Management Practices (BMPs) and forecast if upcoming work may need additional controls in place.

4.3.9 **Follow MPCA Green Practices/Procedures Relative to Remediation Projects:**

Nova is familiar with the MPCA green initiatives and will follow the MPCA Greener Practices relative to investigation and remediation procedures. Field results will be evaluated and a Site Conceptual Model including Green and Sustainable Remediation (GSR) options will be prepared on a site-specific basis. The goal of each GSR will be to reflect the regulatory guidance policies and seek available site incentives, where appropriate.

4.3.10 **Evaluation of soil borings, test pits, environmental boring and soil testing to determine cover integrity and availability of suitable soils.**

Nova has experience in the design and installation of soil borings, test pits, environmental borings, soil testing and the examination of final cover and soil borrow suitability reporting, including review and analysis of soils for final cover systems and landfill liner systems.

4.3.11 **Construction cost estimates using standard engineering practices.**

Nova has prepared proposals and engineer estimates using standard engineering practices including state and federal guidance, and Minnesota Pollution Control Agency guidance.

4.3.12 **Client bid oversight**

Nova services and deliverables include developing, advertising, and distributing plans and specifications and addenda; answering bid questions; conducting pre-bid meetings; evaluating bid submittals, including bidder qualifications review; and recommendations for bid award.

4.3.13 **Preparing construction documentation & certification reports.**

Nova staff is experienced in the oversight and on-site documentation of construction activities, including preparation of field notes; photographic documentation; organization of as-built details; and certification of reports.

4.3.14 **Preparing Operation and Maintenance (O&M) Manuals.**

Nova staff is experienced in both conducting and overseeing operations and maintenance, as well as writing plans for long term involvement, on a variety of remedial systems & landfill systems including leachate management & controls; final cover; waste fill planning; landfill gas; pump and treat, sparge and soil vapor extraction.

## 4.4 ENVIRONMENTAL SITE INVESTIGATION SERVICES

Nova's environmental staff has extensive experience with collecting soil, sediment, vapor, groundwater and ambient air monitoring samples during site investigations. Sample collections follow the appropriate Guidance Document guidelines to ensure that the results satisfy MPCA requirements. In addition, Nova has two Geoprobe direct push drilling rigs available for soil boring and monitoring well installations. The direct push methodology provides the capability for rapid site field characterization with minimal disturbance to the site or on-site business activities. The staff are experienced with the drilling tasks including coordinating utility clearances, communicating with the property owner during on-site activities and conducting tail-gate safety meetings prior to commencing work.

4.4.1 **Arrange for Site Access:**

Nova will communicate and arrange site access with the site contact(s) and/or property owner(s) prior to commencing any site visits and investigation activities. In return for site access, Nova will make every attempt to minimize the disruption to the property owner and/or occupants while site

activities are being conducted. If site access is not granted, Nova will ask that the MPCA or MCA act as an intermediary to facilitate access to the site so that the investigation activities can be completed.

4.4.2 **Coordinate Utility Access:**

Nova will arrange for clearing all public and private underground utilities prior to beginning site activities. The utilities will be cleared by contacting the appropriate state utility clearing service and private utility locating service providers as necessary and if applicable, coordinating traffic control.

4.4.3 **Oversee Site Investigation Services for Soil Boring Advancement and Well Installation:**

Nova's environmental staff is experienced with directing standard drilling methods during site investigation activities. In addition, Nova has two Geoprobe direct push drilling rigs available for soil boring and monitoring well installations. The direct push methodology provides the capability for rapid site field characterization with minimal disturbance to the site or on-site business activities. The staff are experienced with the drilling tasks including coordinating utility clearances, communicating with the property owner during on-site activities and conducting tail-gate safety meetings prior to commencing work.

4.4.4 **Conduct Groundwater, Soil, Surface Water, Sediment and Air Sampling and Monitoring:**

Nova's environmental staff receives continuous training to stay up-to-date on best management practices for site investigation tasks including sample collection and field documentation for groundwater, soil, surface water, sediment, soil vapor and ambient air. The staff follows the appropriate MPCA Guidance Documents from project inception through reporting to ensure that the field tasks satisfy the MPCA requirements

4.4.5 **Conduct Vapor/Air Monitoring for Health and Safety and Air Quality Criteria:**

Nova staff has experience in vapor and air monitoring for health and safety and air quality criteria during remedial actions, asbestos abatement and for LEED credits and WELL™ certification. Area sampling contaminants monitored have included, but are not limited to carbon monoxide, volatile organic compounds (VOCs), particulate matter (2.5 & 10), ozone, formaldehyde, asbestos and mold.

4.4.6 **Conduct Groundwater, Soil, Surface Water, Sediment and Air Sampling and Monitoring:**

Nova's environmental staff receives continuous training to stay up-to-date on best management practices for site investigation tasks including sample collection and field documentation for groundwater, soil, surface water, sediment, soil vapor and ambient air. The staff follows the appropriate MPCA Guidance Documents from project inception through reporting to ensure that the field tasks satisfy the MPCA requirements

4.4.7 **Conduct/oversee studies of hydrogeology, geology and soils utilizing geophysical studies, modeling, and dye trace studies**

Nova's environmental staff has experience and professional accreditation required to evaluate regional and local hydrogeology, geology, and oversee geophysical, modelling and dye trace studies.

4.4.8 **Perform Aquifer Pump Tests:**

Nova's staff is experienced in preparing MDH and MPCA approved pump test plans, and conducting and analyzing the data obtained from aquifer pump tests.

4.4.9 **Arrange for Geophysical Activities:**

Nova is familiar with local geophysical contractors and can schedule work with them on a site-specific or as-needed basis.

## 4.5 ENVIRONMENTAL SITE MANAGEMENT SERVICES

4.5.1 **Arrange for Transportation, Storage and Proper Management of Wastes:**

Nova maintains relationships with several Petrofund-approved contractors. If petroleum-impacted soil or groundwater is encountered during field investigations, Nova follows the appropriate MPCA guidance document to determine if the impacted media should be removed for proper disposal. Nova works with the removal contractor to ensure that the proper documentation is prepared and approved prior to removing the soil or groundwater from the site and ensures all documentation is kept throughout the process.

4.5.2 **Prepare and Evaluate Reports:**

Following completion of the field investigation activities and receipt of the laboratory analytical results, Nova will compile the data into a report format acceptable to the regulatory agency and present a comprehensive array of diagrams depicting the sampling locations, and tables and boring logs summarizing the field and analytical results. As part of the presentation of the findings, Nova will participate in a conference call and/or a person-to-person meeting to review the collected information and discuss the need for additional investigation, cleanup and/or regulatory compliance reporting.

4.5.3 **Coordinate and Cooperate with Other State-Contracted Services:**

Nova maintains relationships with several State-approved contractors and will assist with coordination activities including sampling, analytical, emergency response and hazardous waste services to maintain project schedules and deliverables.

4.5.4 **Oversee subcontractors and state contractors during investigation, cleanups, and construction activities.**

Nova's environmental staff has extensive experience with environmental investigations, cleanups and construction activities. The staff are experienced with the pre-mobilization including coordinating utility clearances and communicating with clients during on-site meetings to collect as

much information as possible for bid preparation. Nova's relationships with general contractors and analytical laboratories allows for the flexibility to provide competitive pricing for cost proposals. Nova's cost proposals are prepared and then reviewed by senior staff prior to submitting them with the appropriate bid documents to the MPCA. Nova's environmental staff receives training in standard construction practices and environmental investigations, including soil screening and sample collection and field documentation. The staff follows the appropriate MPCA Guidance Documents from project inception through reporting to ensure that the field tasks and certification requirements satisfy the MPCA requirements.

4.5.5 **Evaluate Invoices and data reports:**

Nova proposes to review third party data reports and invoice project services on a time and materials (not to exceed) basis in accordance with the approved schedule of fees and our general services contract. Draft invoices with a breakdown of labor, equipment and subcontracted fees are submitted to the Project manager for review and approval. Prior written approval will be obtained in advance of incurring any additional costs for services that are recommended as part of this RFP.

4.5.6 **Collect and Manage Field and Laboratory Data for Electronic Submittal in a Format Specified by the MPCA.**

Nova's environmental staff receives continuous training to stay up-to-date on best management practices for site investigation tasks. The staff follows the appropriate MPCA Guidance Documents from project inception through reporting to ensure that the field tasks satisfy the MPCA requirements. Nova will work with MPCA staff to ensure all field and laboratory data is collected and managed as requested for creation of project specific EDDs in the format specified by the MPCA.

4.5.7 **Evaluate data quality and prepare data verification reports**

Nova has experience evaluating data according to MPCA approved quality assurance/quality control work plans and understands general analytical laboratory, contractor and subcontractor data submittals.

4.5.8 **Prepare and review Quality Assurance Project Plans (QAPP) and Sampling and Analysis Plans (SAP) in accordance with state and federal requirements.**

Nova staff have experience preparing and reviewing quality assurance project plans, sampling and analysis plans and site specific environmental monitoring plans, in accordance with state and federal requirements as they pertain to environmental monitoring.

4.5.9 **Perform/oversee remedial action plans.**

Nova have experienced professionals who have performed and provided oversight to implement remedial action plans, including groundwater monitoring plans; soil sampling, screening and disposal plans; soil vapor extraction designs and implementation; long term monitoring of soil, vapor and groundwater; and landfill final cover construction.

4.5.10 **Conduct third party review and analysis of designs, reports and technical information when requested by the MPCA for the purpose of providing conclusions and recommendations to the State**

Nova staff are professionals who have provided third party analysis and review of construction & remediation designs; closure plans; construction reports; and technical reports at client requests to oversee contractors and subcontractors to confirm review work plans and work completed

4.5.11 **Perform five-year reviews and site reviews**

Nova staff have experienced professionals who can review closed landfill programs, including review of environmental monitoring; leachate management; landfill inspections; financial assurance estimates; and SWPPPs.

4.5.12 **Review groundwater remediation technologies and recommend alternatives and optimization options**

Nova staff have reviewed and implemented multiple remediation technologies, prepared feasibility studies for alternatives and optimization.

4.5.13 **Prepare presentations and present information at meetings.**

Nova staff have prepared presentations and presented information, including specific deliverables such as power point presentations; 2-dimensional and three-dimensional illustrations of construction operations, groundwater plumes, and investigative results, and have further experience acting as expert witnesses in judicial cases.

4.5.14 **Provide technical assistance to the State in the evaluation and interpretation of data and information.**

Nova staff members are experienced in the engineering and scientific disciplines required to evaluate and interpret technical data and information as needed to assess conceptual and actual remedial designs as they relate to final cover systems; liner systems; landfill leachate controls; remedial investigations; and soil, water and air analytics.

4.5.15 **Assist and Provide Training as Requested by MPCA:**

Nova staff members are experienced with providing training with a variety of environmentally-related subjects and are willing to provide training or assistance to the MPCA as needed. In addition, Nova encourages staff members to engage in regular training to hone understanding and skills, including those covered in this Master Contract.

### 4.5.16 **Provide project management and construction oversight.**

Nova staff are experienced in providing project management and construction oversight as it entails the following:

- Project coordination;
- One or more qualified representatives at the project site at all times when the construction contractor is conducting significant work or when otherwise directed by the MPCA Site Team;
- Ensuring that all specifications are met, by reviewing tests including, but not limited to, equipment and material submittals, liner testing, soil compaction, soil gradation, materials placement, elevation grades, and concrete testing;
- Conducting weekly progress meetings, preparing a weekly construction agenda, and distributing a summary
- of the weekly construction meeting minutes;
- Reviewing and approving construction contractor invoices;
- Erosion control measures inspections;
- Oversee equipment/system start-up and trouble shoot problems with the Contractor/Vendor for repair and newly installed remediation systems;
- Participation in or conduct other public and project management meetings.

## 5. EXAMPLE SCENARIO

The completed Example Work Plan (Attachment A) and Example Scenario Project Spreadsheet (Attachment B) are provided in the next section below.

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

# Scenario C Closed Landfill Workplan

**PREPARED FOR**

**MINNESOTA POLLUTION CONTROL AGENCY**
**520 LAFAYETTE ROAD**
**ST. PAUL, MN 55155-4194**

**PREPARED BY**

**NOVA CONSULTING GROUP, INC.**
**1107 HAZELTINE BLVD**
**CHASKA, MN 55318**

**Project Title:** 30 Acre Closed Landfill Evaluation

## 1. Project Summary:

A 30-acre rural closed landfill operating unpermitted from 1965 to 1972, and permitted until closure in 1983 is proposed for entering the Closed Landfill program.

Residential developments with city water and sewer exist to the south and west, with expectations of additional future developments.

A cattle farm with 75 Units and private drinking water well exists to the east, and reports of dead corn adjacent to the landfill. Residential developments have private wells permitted for Irrigation, and southern residents report strange odors in their irrigation systems.

Topographic characteristics of the closed landfill, including significant ponding on final cover, and reported details of poor construction materials, including the use of porous gravel, suggest the existing final cover is in poor to unknown condition.

Boring logs indicate the area sits above mixed sand and clay glacial till. Review of stream maps and residential concerns regarding odors suggest a south-southeast groundwater/contaminant flow.

## 2. Statement of Problems, Opportunities, and Existing Conditions

The following problems exist at the 30 Acre site:

1. Waste has been placed near property boundaries limiting both ease of investigative techniques and engineering control installation. A visible and highly interactive investigation must work with city and owners to provide consistent investigation and remediation controls.
2. Dead corn to the east indicates contaminated soil and/or runoff, and concerns regarding livestock poisoning potential.
3. Odors in irrigation systems to the south indicate a groundwater plume migration to the south through intermixed sand seams.
4. Final cover has gone into disrepair & is reportedly not a significant barrier to stormwater infiltration into waste in some locations.
5. Monitoring system appear in adequate for western and southern boundaries, and may not monitor primary contaminant pathways in intermixed clay/sand till units

The existing conditions present several contaminant pathways of concern, requiring different levels of investigation, engineering and remedial controls.

**To the East**: Descriptions of final cover conditions and reported dead corn, one might expect that stormwater, contaminated from interaction with waste and poorly managed run off due to poor construction and/or heavy settlement lead to crop die offs. Or Issues could be as simple as overloading of salts, or as complex as shallow groundwater ponding adjacent to seepage conditions. Subsurface landfill gas migration off-site may also explain crop failures. Further east, it should be determined whether private drinking water for the 75 Cattle units is contaminated and the potential for contaminated groundwater migration in this area. Evaluation should define existing Final Cover conditions and remedial expectations including: new design grades; improvements to cap; stormwater control improvements; to prevent primary contaminant pathway from stormwater to leachate seepage.

**To the South:** Reports of foul odors in irrigation systems suggest potential large-scale plume development or subsurface landfill gas migration off-site; an evaluation of existing monitoring systems should provide a preliminary delineation between landfill or other land use activities and/or natural conditions, ie, buried peat or unknown human development burials. Remedies could include whether a groundwater remediation system, institution controls on land development, or additional groundwater monitoring is applicable for long term remedies.

**To the West:** Existing monitoring wells appear insufficiently placed to identify groundwater migration, and limited number of gas vents are placed in the west. A risk assessment in this area should identify proper engineering and/or institutional controls to restrict development, and identify appropriate setbacks for development.

**To the North:** We assume the North area is pristine conditions and investigations and remedial actions are limited to background monitoring.

## 3. Goals, Objectives, Tasks, and Subtasks

### OBJECTIVE 1: DEFINE EXISTING CONDITIONS, AREAS OF CONCERN, CONTAMINANTS OF CONCERN

#### 1 - TASK A HISTORICAL BACKGROUND & PHASE I ASSESSMENT

**Subtask 1:** Review & Identify Engineering as-builts, regulatory reports, environmental database searches, parcel searches, boring/well records, historical construction methods, and waste disposal reports

**Subtask 2:** Review topographic, geologic, hydrogeologic site details

**Subtask 3:** Discuss concerns with Local authority/owner, reports of irrigation systems, and other existing public information

#### 1 – TASK B REMEDIAL INVESTIGATION WORKPLAN

**Subtask 1:** Locate and Identify Areas of Concern (AOC): dead corn extents, final cover damage locations, poor construction material locations, irrigation wells w/odors, etc.

**Subtask 2:** Locate and Identify Potential Contaminants of Concern (PCOC): methane, sulfur, nitrates, Total Organic Carbon, VOCs, PAHs, PFCs, PFAs, emerging contaminants of concern, etc.

**Subtask 3:** Review site access restrictions and identify any new technologies for investigation

**Subtask 4:** Develop Site Specific Project Plans for Remedial Investigation (RI): Health & Safety plan; Sampling and Analysis Plan with Comprehensive QA/QC protocols; Environmental Monitoring Plan; Observation, Documentation & Data Management Plan; Technical Specifications for Wells, Borings and Excavations

#### 1 - TASK C PRELIMINARY FIELD INSPECTION

**Subtask 1:** Inspect Final Cover & Stormwater controls

**Subtask 2:** Observe and Document existing conditions, including extent of dead corn, irrigation system odors, poor drainage locations, final cover damage, and any other recorded areas of concern from Phase I review.

**Subtask 3:** Map extent and location of Potential Areas of Concern

#### 1 - TASK D PRESENT TO STAKEHOLDERS

**Subtask 1:** Prepare presentation materials from Phase I Assessment

**Subtask 2:** Outline Remedial Investigation Work Plan to Stakeholders

**Subtask 3:** Revise Remedial Investigation Work Plan as needed to address stakeholder concerns regarding Potential Contaminants of Concern (PCOC) and Areas of Concern (AOC)

#### 1 - TIMELINE

Task A (Phase I Assessment): ..... 1 Month(s)
Task B – Concurrent w/A & C (Remedial Investigation Workplan) ..... 1 Month(s)
Task C (Preliminary On-site Inspection): ..... 1 Month(s)
Task D Concurrent w/B (Present to Stakeholders) ..... 1 Month(s)

#### 1 – DELIVERABLES

Approved Phase I Investigation Report w/Preliminary Field Inspection, Remedial Investigation Presentation, Approved Remedial Investigation Work Plan

## OBJECTIVE 2: REMEDIAL INVESTIGATION TO DEFINE ENVIRONMENTAL CONTAMINANT EXTENTS

### 2 - TASK A: FIELD INVESTIGATION PATHWAYS – SOIL / SOIL VAPOR

**Subtask 1:** Prepare and Execute subcontract documents required for Investigation according to the Approved Remedial Investigation Workplan

**Subtask 2:** Inspect & Collect representative soil & soil vapor samples from final cover areas and areas adjacent to west, south and east in Areas of Concern

### 2 – TASK B: FIELD INVESTIGATION PATHWAYS – STORMWATER / GROUNDWATER

**Subtask 1:** Prepare and Execute subcontract documents required for Investigation according to the Approved Remedial Investigation Workplan

**Subtask 2:** Inspect & Collect representative Monitoring well, Private Well & Irrigation well samples and readily accessible stormwater samples, including seasonal variations (Spring, Summer, Fall)

**Subtask 3:** Assuming intermixed clay and sand prohibits comprehensive contaminant pathway determination & extent, as discussions with stakeholders and as sample results/risk assessments dictate in Subtask 2, or as needed in Task A or C, execute rapid field laboratory analysis of soil, vapor, or water, including vertical groundwater profiles & sample collection using geoprobe or rotosonic borings and temporary monitoring wells to establish vertical and horizontal plume/contaminant limits as needed to assist in risk evaluation and contaminant pathway monitoring & control requirement determinations. (ECAD, 2010-2015).

### 2 – TASK C: FIELD INVESTIGATION PATHWAYS – FINAL COVER CONDITIONS/LANDFILL GAS

**Subtask 1:** Prepare and Execute subcontract documents required for Investigation according to the Approved Remedial Investigation Workplan

**Subtask 2:** Excavate test pits at areas of concern to observe and document final cover conditions.

**Subtask 3:** Inspect & Monitor passive vent system for Spring, Summer and Fall (lfg field analysis, Suma Canisters for TO-15 analysis)

### 2 – TASK D: REMEDIAL INVESTIGATION OVERSIGHT & REPORT

**Subtask 1:** Submit Electronic Data Deliverables and communicate preliminary analysis results as necessary to aid in rapid regulatory confidence in site & contaminant concerns and extent for preliminary risk evaluations, to reduce the possibility of remobilization

**Subtask 2:** Identify and delineate as warranted required risk assessment pathways in areas of concern and for contaminants of concern

**Subtask 3:** Prepare presentation of preliminary Remedial Investigation results to stakeholders and publish final report with any additional information or recommendations for further investigations and outline necessary performance criteria for risk based evaluation & feasibility study/remedy selection

### 2 - TIMELINE

Task A - Concurrent w/FI (FI / Soil/Soil Vapor): ..... 1 Month(s)
Task B – Concurrent w/FI (FI / Stormwater/Groundwater)..... 6 Month(s)
Task C – Concurrent w/FI (FI / Final Cover/ LFG): ..... 1 Month(s)
Task D – Concurrent w/FI (Remedial Investigation Oversight & Report) ..... 8 Month(s)

### 2 – DELIVERABLES

Remedial Investigation Presentation, Approved Remedial Investigation Report

## OBJECTIVE 3: RISK EVALUATION, REMED(Y/IES) SELECTION, REMEDIAL ACTION PLAN PREPARATION AND VERIFY IMPLEMENTATION RESULTS

### 3 - TASK A: RISK BASED SITE EVALUATION (RBSE)

**Subtask 1:** Prepare Risk Based Site Evaluation including Site description & characterization; Identification of chemicals of potential concern (COPC); Identify current and planned resource use; Receptor and pathway evaluation; Identify Exposure Areas; Risk based evaluation for Tier Evaluation; and Risk characterization

**Subtask 2:** Prepare conclusions and recommendations from site characterization, including extent and magnitude of the impact, and the risk characterization developed during the tier evaluation should be detailed in a report

**Subtask 3:** Communicate with Stakeholders preliminary RBSE results based on any Areas of Concern rankings, contaminants of concern and remedial & environmental monitoring expectations, and solicit feedback & agreement on goals for engineering & regulatory controls

### 3 - TASK B FOCUSED FEASIBILITY STUDY/REMEDY SELECTION

**Subtask 1:** Identify & evaluate potential remedial locations & associated options as applicable, including new technologies reviews, draft technical specifications and pilot study needs

### 3 - TASK C REMEDIAL ACTION PLAN (RAP)

**Subtask 1:** Prepare RAP which presents methods, procedures, technical specifications and requirements, along with necessary approvals, which shall describe remedies to implement, such as: final cover improvements; environmental monitoring improvements for groundwater, soil vapor, landfill gas; soil excavation and disposal; soil vapor extraction; groundwater remediation; pilot test plans; institutional and development controls; and any recommendations for additional evaluations to limit exposures & risks to Human Health & the Environment

**Subtask 2:** Prepare bid and contract documents and assist MPCA with publishing bids for Remedial Implementation including: Engineers estimate according to standard practice; Ad for bids; Bid Addenda; Conduct pre-bid meeting; Contractor qualifications review; Recommendation for Award; Provide professional oversight of work; Provide Construction Certification

### 3 - TASK D REMEDIAL ACTION IMPLEMENTATION (BY OTHERS)

**Subtask 1:** Implementation of RAP by Others

### 3 - TASK E REMEDIAL ACTION IMPLEMENTATION REPORT

**Subtask 1:** Prepare Remedial Action Implementation report, in concert with others, which documents the activities performed under the remedial action plan; reports any additional sampling and analysis details as required by implementation; reports on the overall success of the remedy; and recommends any additional actions as warranted.

**Subtask 2:** Perform final walk through inspections and collect any additional monitoring data to support recommendations for environmental monitoring, operations and maintenance for closure and post-closure care

### 3 - TIMELINE:

Task A (Focused Feasibility Study/Remedy Selection): ..... 1 Month(s)
Task B (Remedial Action Plan): ..... 2 Month(s)
Task C (Remedial Action Implementation): ..... 1 Year(s)
Task D Concurrent w/C (Remedial Action Implementation Report): ..... 1 Year (s)

### 3 – DELIVERABLES:

Approved Risk Based Site Evaluation Report, Approved Remedy Selection Report, Approved Remedial Action Plan, Approved Remedial Action Implementation Report

## REFRENCES

*Environmental Concepts & Design, Inc. January, 2010. 2010 Groundwater Plume Investigation Work Plan. Kandiyohi County Sanitary Landfill, Permit No. SW-79.*

*ECAD Engineering, February 21, 2012. Work Plan: Donald Jordon Private Water Well. Kandiyohi County Sanitary Landfill Permit, No. SW-79*

*ECAD Engineering, November 15, 2012. 2012 Work Plan Amendment: Revised Monitoring Well Installation Information. Kandiyohi County Sanitary Landfill Permit, No. SW-79*

*ECAD Engineering, May 2013. Groundwater Plume Investigation Report. Kandiyohi County Sanitary Landfill Permit, No. SW-79*

*ECAD Engineering, May 2014. 2010-2013 Corrective Action Groundwater Plume Limits Investigation, Kandiyohi County Landfill,* https://www.youtube.com/watch?v=ELoWK4yUfr8 *Kandiyohi County Sanitary Landfill Permit, No. SW-79*

*ECAD Engineering, April 2015. Groundwater Plume Investigation Report. Kandiyohi County Sanitary Landfill Permit, No. SW-79*

NOVA CONSULTING

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

# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR
MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 1. Personnel | | | | | 2. Subcontracting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | Engineer 3 | Project Manager | Scientist 2 | Field Technician | GIS/CADD Specialist | Environmental Data Report | Contract Laboratory | Contract Field Laboratory | Rotosonic Drill Rig | Excavator |
| **OBJECTIVE 1: DEFINE EXISTING CONDITIONS, AREAS OF CONCERN, CONTAMINANTS OF CONCERN** | | | | | | | | | | |
| **Task A** HISTORICAL BACKGROUND & PHASE I ASSESSMENT | 5 | 20 | 30 | 30 | 5 | $3,000 | | | | |
| **Task B** REMEDIAL INVESTIGATION WORKPLAN | 10 | 30 | 30 | 10 | 20 | | | | | |
| **Task C** PRELIMINARY FIELD INSPECTION | 5 | 5 | 20 | 30 | 5 | | | | | |
| **Task D** PRESENT TO STAKEHOLDERS | 10 | 20 | 5 | 0 | 10 | | | | | |
| ***Objective 1 Totals*** | ***30 HR*** | ***75 HR*** | ***85 HR*** | ***70 HR*** | ***40 HR*** | *$3,000* | *$0* | *$0* | *$0* | *$0* |
| *Subcontract Rates* | *137.52/HR* | *137.52/HR* | *97.48/HR* | *78.09/HR* | *78.09/HR* | *$ 3,000* | *$ -* | *$ -* | *$ -* | *$ -* |
| **Schedule 1 Extension Totals** | **$4,125.60** | **$10,314.00** | **$8,285.80** | **$5,466.30** | **$3,123.60** | **$3,000.00** | **$0.00** | **$0.00** | **$ -** | **$ -** |

NOVA CONSULTING

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
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# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 3. Equipment | | | | | | | | | | | 4. Other Expenses | | | | Totals (Extended) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | GPS (Submeter) | Photoionization Detector (PID) 10.6 | Screen for Soil Gas Monitoring Points | Temperature, pH, conductivity, ORP meter | Pump/Slug Testing Equipment | Submersible Pump | Generator | YSI Multi Meter w/ Flow Cell | Water Level Indicator | Multi Gas Meter (02/CO/LEL/Methane ) | Manual direct-push probe equip. | Mileage (100 mi RT to Site or meetings) | Inhouse Geoprobe | Room | Per Diem | |
| | **OBJECTIVE 1: DEFINE EXISTING CONDITIONS, AREAS OF CONCERN, CONTAMINANTS OF CONCERN** | | | | | | | | | | | | | | | |
| **Task A** HISTORICAL BACKGROUND & PHASE I ASSESSMENT | | | | | | | | | | | | | | | | |
| **Task B** REMEDIAL INVESTIGATION WORKPLAN | | | | | | | | | | | | | | | | |
| **Task C** PRELIMINARY FIELD INSPECTION | **2 DAYS** | **2 DAYS** | | **2 DAYS** | | | | | | **2 DAYS** | | **200 Mi** | | **2 DAYS** | **2 DAYS** | |
| **Task D** PRESENT TO STAKEHOLDERS | | | | | | | | | | | | | | | | |
| ***Objective 1 Totals*** | ***2 DAYS*** | ***2 DAYS*** | ***0 DAYS*** | ***2 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***2 DAYS*** | ***0 DAYS*** | ***200 Mi*** | ***0 DAYS*** | ***2 DAYS*** | ***2 DAYS*** | |
| *Subcontract Rates* | *$122.00* | *$99.00* | *$51.00* | *$68.00* | *$110.00* | *$52.00* | *$65.00* | *$117.00* | *$27.00* | *$123.00* | *$165.00* | *0.545/Mi* | *$ 1,800* | *100.00/Day* | *36.00/Day* | |
| **Schedule 1 Extension Totals** | **$244.00** | **$198.00** | **$0.00** | **$136.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$246.00** | **$0.00** | **$109.00** | **$0.00** | **$200.00** | **$72.00** | **$35,520.30** |

NOVA CONSULTING

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

# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR
MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 1. Personnel | | | | | 2. Subcontracting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | Engineer 3 | Project Manager | Scientist 2 | Field Technician | GIS/CADD Specialist | Environmental Data Report | Contract Laboratory | Contract Field Laboratory | Rotosonic Drill Rig | Excavator |
| **OBJECTIVE 2: REMEDIAL INVESTIGATION TO DEFINE ENVIRONMENTAL CONTAMINANT EXTENTS** | | | | | | | | | | |
| **Task A** FI PATHWAYS – SOIL / SOIL VAPOR | 5 | 10 | 30 | 60 | 5 | | $10,000 | | | $5,000 |
| **Task B** FI PATHWAYS – STORMWATER / GROUNDWATER | 10 | 10 | 30 | 60 | 5 | | $5,000 | $25,000 | $50,000 | |
| **Task C** FI PATHWAYS – FINAL COVER CONDITIONS / LANDFILL GAS | 30 | 10 | 10 | 60 | 5 | | $10,000 | | | $20,000 |
| **Task D** REMEDIAL INVESTIGATION OVERSIGHT & REPORT | 30 | 40 | 40 | 10 | 40 | | | | | |
| ***Objective 2 Totals*** | ***75 HR*** | ***70 HR*** | ***110 HR*** | ***190 HR*** | ***55 HR*** | *$0* | *$25,000* | *$25,000* | *$50,000* | *$25,000* |
| *Subcontract Rates* | *137.52/HR* | *137.52/HR* | *97.48/HR* | *78.09/HR* | *78.09/HR* | *$ -* | *$ 25,000* | *$ 25,000* | *$ 50,000* | *$ 25,000* |
| **Schedule 1 Extension Totals** | **$10,314.00** | **$9,626.40** | **$10,722.80** | **$14,837.10** | **$4,294.95** | **$0.00** | **$25,000.00** | **$25,000.00** | **$ 50,000** | **$ 25,000** |

NOVA CONSULTING

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

# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR: MINNESOTA POLLUTION CONTROL AGENCY, 520 LAFAYETTE ROAD, ST. PAUL, MN 55155-4194

PREPARED BY: NOVA CONSULTING GROUP, INC., 1107 HAZELTINE BLVD, CHASKA, MN 55318

| | 3. Equipment | | | | | | | | | | | 4. Other Expenses | | | | Totals (Extended) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | GPS (Submeter) | Photoionization Detector (PID) 10.6 | Screen for Soil Gas Monitoring Points | Temperature, pH, conductivity, ORP meter | Pump/Slug Testing Equipment | Submersible Pump | Generator | YSI Multi Meter w/ Flow Cell | Water Level Indicator | Multi Gas Meter (02/CO/LEL/Methane | Manual direct-push probe equip. | Mileage (100 mi RT to Site or meetings) | Inhouse Geoprobe | Room | Per Diem | |
| | **OBJECTIVE 2: REMEDIAL INVESTIGATION TO DEFINE ENVIRONMENTAL CONTAMINANT EXTENTS** | | | | | | | | | | | | | | | |
| **Task A** FI PATHWAYS – SOIL / SOIL VAPOR | 2 DAYS | 6 DAYS | 6 DAYS | | | | | | | | 2 DAYS | 300 Mi | 6 DAYS | 6 DAYS | 6 DAYS | |
| **Task B** FI PATHWAYS – STORMWATER / GROUNDWATER | | 6 DAYS | | 2 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | | | 300 Mi | 2 DAYS | 6 DAYS | 6 DAYS | |
| **Task C** FI PATHWAYS – FINAL COVER CONDITIONS / LANDFILL GAS | 2 DAYS | | | | | | | | | 6 DAYS | | 300 Mi | 6 DAYS | 6 DAYS | 6 DAYS | |
| **Task D** REMEDIAL INVESTIGATION OVERSIGHT & REPORT | | | | | | | | | | | | 300 Mi | | 3 DAYS | 3 DAYS | |
| ***Objective 2 Totals*** | *4 DAYS* | *12 DAYS* | *6 DAYS* | *2 DAYS* | *6 DAYS* | *6 DAYS* | *6 DAYS* | *6 DAYS* | *6 DAYS* | *6 DAYS* | *2 DAYS* | *1200 Mi* | *14 DAYS* | *21 DAYS* | *21 DAYS* | |
| *Subcontract Rates* | *$122.00* | *$99.00* | *$51.00* | *$68.00* | *$110.00* | *$52.00* | *$65.00* | *$117.00* | *$27.00* | *$123.00* | *$165.00* | *0.545/Mi* | *$ 1,800* | *100.00/Day* | *36.00/Day* | |
| **Schedule 1 Extension Totals** | **$488.00** | **$1,188.00** | **$306.00** | **$136.00** | **$660.00** | **$312.00** | **$390.00** | **$702.00** | **$162.00** | **$738.00** | **$330.00** | **$654.00** | **$25,200.00** | **$2,100.00** | **$756.00** | **$208,917.25** |

NOVA CONSULTING

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

# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR
MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 1. Personnel | | | | | 2. Subcontracting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | Engineer 3 | Project Manager | Scientist 2 | Field Technician | GIS/CADD Specialist | Environmental Data Report | Contract Laboratory | Contract Field Laboratory | Rotosonic Drill Rig | Excavator |
| **OBJECTIVE 3: RISK EVALUATION, REMED(Y/IES) SELECTION, REMEDIAL ACTION PLAN PREPARATION AND VERIFY IMPLEMENTATION RESULTS** | | | | | | | | | | |
| **Task A** RISK BASED SITE EVALUATION (RBSE) | 10 | 10 | 40 | 0 | 10 | | | | | |
| **Task B** FOCUSED FEASIBILITY STUDY/REMEDY SELECTION | 30 | 10 | 30 | 10 | 10 | | | | | |
| **Task C** REMEDIAL ACTION PLAN (RAP) | 5 | 20 | 20 | 0 | 10 | | | | | |
| **Task D** REMEDIAL ACTION IMPLEMENTATION (BY OTHERS) | 5 | 20 | 0 | 10 | 0 | | | | | |
| **Task E** REMEDIAL ACTION IMPLEMENTATION REPORT | 10 | 30 | 30 | 30 | 20 | | | | | |
| ***Objective 3 Totals*** | ***60 HR*** | ***90 HR*** | ***120 HR*** | ***50 HR*** | ***50 HR*** | *$0* | *$0* | *$0* | *$0* | *$0* |
| *Subcontract Rates* | *137.52/HR* | *137.52/HR* | *97.48/HR* | *78.09/HR* | *78.09/HR* | $ - | $ - | $ - | $ - | $ - |
| **Schedule 1 Extension Totals** | **$8,251.20** | **$12,376.80** | **$11,697.60** | **$3,904.50** | **$3,904.50** | **$0.00** | **$0.00** | **$0.00** | **$ -** | **$ -** |

NOVA CONSULTING

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

# Attachment B
# *Example Scenario Project Spreadsheet

**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR: MINNESOTA POLLUTION CONTROL AGENCY, 520 LAFAYETTE ROAD, ST. PAUL, MN 55155-4194

PREPARED BY: NOVA CONSULTING GROUP, INC., 1107 HAZELTINE BLVD, CHASKA, MN 55318

| | 3. Equipment | | | | | | | | | | | 4. Other Expenses | | | | Totals (Extended) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | GPS (Submeter) | Photoionization Detector (PID) 10.6 | Screen for Soil Gas Monitoring Points | Temperature, pH, conductivity, ORP meter | Pump/Slug Testing Equipment | Submersible Pump | Generator | YSI Multi Meter w/ Flow Cell | Water Level Indicator | Multi Gas Meter (02/CO/LEL/Methane ) | Manual direct-push probe equip. | Mileage (100 mi RT to Site or meetings) | Inhouse Geoprobe | Room | Per Diem | |
| | **OBJECTIVE 3: RISK EVALUATION, REMED(Y/IES) SELECTION, REMEDIAL ACTION PLAN PREPARATION AND VERIFY IMPLEMENTATION RESULTS** | | | | | | | | | | | | | | | |
| **Task A** RISK BASED SITE EVALUATION (RBSE) | | | | | | | | | | | | | | | | |
| **Task B** FOCUSED FEASIBILITY STUDY/REMEDY SELECTION | | | | | | | | | | | | | | | | |
| **Task C** REMEDIAL ACTION PLAN (RAP) | | | | | | | | | | | | | | | | |
| **Task D** REMEDIAL ACTION IMPLEMENTATION (BY OTHERS) | | | | | | | | | | | | | | | | |
| **Task E** REMEDIAL ACTION IMPLEMENTATION REPORT | **1 DAYS** | **1 DAYS** | | **1 DAYS** | | **1 DAYS** | **1 DAYS** | **1 DAYS** | **1 DAYS** | **1 DAYS** | | **200 Mi** | | **2 DAYS** | **2 DAYS** | |
| ***Objective 3 Totals*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | ***0 Mi*** | ***0 DAYS*** | ***0 DAYS*** | ***0 DAYS*** | |
| *Subcontract Rates* | *$122.00* | *$99.00* | *$51.00* | *$68.00* | *$110.00* | *$52.00* | *$65.00* | *$117.00* | *$27.00* | *$123.00* | *$165.00* | *0.545/Mi* | *$ 1,800* | *100.00/Day* | *36.00/Day* | |
| **Schedule 1 Extension Totals** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$0.00** | **$40,134.60** |

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

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**Project title:**
**30 Acre Closed Landfill Evaluation**

PREPARED FOR
MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 1. Personnel | | | | | 2. Subcontracting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | Engineer 3 | Project Manager | Scientist 2 | Field Technician | GIS/CADD Specialist | Environmental Data Report | Contract Laboratory | Contract Field Laboratory | Rotosonic Drill Rig | Excavator |
| **Summary** | | | | | | | | | | |
| ***OBJECTIVE 1: DEFINE EXISTING CONDITIONS, AREAS OF CONCERN, CONTAMINANTS OF CONCERN*** | 30 HR | 75 HR | 85 HR | 70 HR | 40 HR | $3,000 | $0 | $0 | $0 | $0 |
| ***OBJECTIVE 2: REMEDIAL INVESTIGATION TO DEFINE ENVIRONMENTAL CONTAMINANT EXTENTS*** | 75 HR | 70 HR | 110 HR | 190 HR | 55 HR | $0 | $25,000 | $25,000 | $50,000 | $25,000 |
| ***OBJECTIVE 3: RISK EVALUATION, REMED(Y/IES) SELECTION, REMEDIAL ACTION PLAN PREPARATION AND VERIFY IMPLEMENTATION RESULTS*** | 60 HR | 90 HR | 120 HR | 50 HR | 50 HR | $0 | $0 | $0 | $0 | $0 |
| **Totals** | 165 HR | 235 HR | 315 HR | 310 HR | 145 HR | $3,000 | $25,000 | $25,000 | $50,000 | $25,000 |

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**30 Acre Closed Landfill Evaluation**

PREPARED FOR MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PREPARED BY NOVA CONSULTING GROUP, INC.
1107 HAZELTINE BLVD
CHASKA, MN 55318

| | 3. Equipment | | | | | | | | | | | 4. Other Expenses | | | | Totals (Extended) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Budget** | GPS (Submeter) | Photoionization Detector (PID) 10.6 | Screen for Soil Gas Monitoring Points | Temperature, pH, conductivity, ORP meter | Pump/Slug Testing Equipment | Submersible Pump | Generator | YSI Multi Meter w/ Flow Cell | Water Level Indicator | Multi Gas Meter (02/CO/LEL/Methane ) | Manual direct-push probe equip. | Mileage (100 mi RT to Site or meetings) | Inhouse Geoprobe | Room | Per Diem | |
| **Summary** | | | | | | | | | | | | | | | | |
| ***OBJECTIVE 1: DEFINE EXISTING CONDITIONS, AREAS OF CONCERN, CONTAMINANTS OF CONCERN*** | 2 DAYS | 2 DAYS | 0 DAYS | 2 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 2 DAYS | 0 DAYS | 200 Mi | 0 DAYS | 2 DAYS | 2 DAYS | $35,520.30 |
| ***OBJECTIVE 2: REMEDIAL INVESTIGATION TO DEFINE ENVIRONMENTAL CONTAMINANT EXTENTS*** | 4 DAYS | 12 DAYS | 6 DAYS | 2 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 2 DAYS | 1200 Mi | 14 DAYS | 21 DAYS | 21 DAYS | $208,917.25 |
| ***OBJECTIVE 3: RISK EVALUATION, REMED(Y/IES) SELECTION, REMEDIAL ACTION PLAN PREPARATION AND VERIFY IMPLEMENTATION RESULTS*** | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 DAYS | 0 Mi | 0 DAYS | 0 DAYS | 0 DAYS | $40,134.60 |
| **Totals** | 6 DAYS | 14 DAYS | 6 DAYS | 4 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 6 DAYS | 8 DAYS | 2 DAYS | 1400 Mi | 14 DAYS | 23 DAYS | 23 DAYS | $284,572.15 |