



*terra***technik**

E N V I R O N M E N T A L L T D .





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Dear Sir / Madam,

Terratechnik is a privately owned remediation contractor engaged in the remediation of contaminated sites by direct excavation and on site technologies. If one of your responsibilities is managing contaminated properties with challenging or unique issues, we would like you to consider our customized approach to remediation. Terratechnik (TTK) understands contaminated site remediation. We have successfully implemented impressive remediation programs for hundreds of properties over the past 14 years. We work **closely** with our clients (consulting engineers, land owners, and developers) as well as with our team of specialized vendors. Together, we represent a group of engineers, contractors, and scientists who design customized, creative remediation plans, based on practical and intelligent techniques.

Terratechnik's Remediation Services

Terratechnik possesses a wealth of experience remediating contaminated sites. Our strength is in combining our construction services with our technical services. Our construction team is responsible for excavation and disposal, underpinning of building foundations, columns and utilities, and on-site soil screening and waste reduction. The construction team works to render the contaminants **accessible** for our technical team to tackle.

Our technical team is involved in any project with an on-site waste treatment component. This includes *in situ* and *ex situ* treatment of inorganic and organic pollutants in soils, ground water and surface waters. On-site treatment strategies include bioremediation, chemical oxidation, chemical reduction, soil washing, phase separation technologies, vapour extraction and multi-phase extraction technologies. Our technical staff also operates laboratory facilities where we perform bench scale feasibility and optimization studies. Pilot scale testing is frequently the next step, in which we are able to fully optimize technologies for implementation on full scale remediation projects.

Terratechnik can easily provide mobile injection services or ground water pump and treat services to support remediation action plans developed by clients using existing infrastructure. Alternatively, we supply, assemble, and commission systems built within mobile treatment trailers as well as full scale remediation programs and automated treatment systems.

Terratechnik has completed numerous *ex situ* and *in situ* remediation projects over the past 14 years and have enviable experience in best management practices and evaluating the technical and financial performance of treatment operations, enabling us to complete difficult projects in the most technically sound and cost effective manner.

We hold numerous **mobile** Certificates of Approval (C's of A) issued by the Ministry of the Environment. This means we can supply our treatment systems to your site anywhere in Ontario without the costs and delays of applying for site specific approvals & permits. We can get straight to work on solving your site contamination issues by simply notifying the Ministry of our Intent to Relocate. The mobile nature of our operation has allowed us to gain extensive experience in installing temporary treatment facilities in numerous locations which require that we deal with site specific constraints and dynamic environmental and climatic conditions. For a full portfolio of our C's of A, please see the attached document: 'Terratechnik's Certificates of Approval Portfolio'.

Terratechnik also provides a number of other services including, but not limited to:

- Pick up and dispose of spent carbon canisters and replace with fresh media.
- Pick up and dispose of purged ground water and/or drill cuttings in bulk or in drums.
- Provide excavation and coring equipment for test pitting.
- Rental of stationary or mobile water treatment systems.
- Support and underpin buildings and utilities to allow the removal of contaminated soils from below floors, walls and column foundations.
- Landfill remediation via waste segregation, reduction, and recycling.
- Large scale excavation & disposal, including removal of fuel tanks (UST & AST).
- On site screening and separation projects as lump sum or unit rate contracts.
- Plant decommissioning and chemical disposal.
- PCB removal and disposal.
- The application of phase separation and filtration technologies (sediment, liquid, and vapour).

Terratechnik has successfully remediated a long list of sites across Ontario over the years. We represent a solid team with many years of experience working together, successfully remediating soils and water. With our pooled resources and experiences, our team looks forward to delivering the services and technologies required to economically and successfully remediate your sites.

Additional information on our company can be found on our web site at www.terratechnik.ca

Sincerely,

Kyle Dacey,
Manager of Technical Services

Jean-Pierre Francios,
Operations Manager

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Terratechnik's Certificates of Approval (Cs of A) Portfolio Issued by the Ministry of the Environment (MOE)

Mobile Discharge to Air Cs of A (EPA, Section 9)

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Metals Treatment Mobile Units:

This C of A allows Terratechnik (TTK) to process metals leachate toxic waste (eg. soils) on site and dispose of the treated waste as non-hazardous. Processing of hazardous materials to render them non-hazardous, ultimately results in huge savings on disposal costs.

We are the exclusive Canadian dealer for MT² LLC – Metals Treatment Technologies for a proprietary technology known as ECOBOND. This metals treatment technology includes chemical treatment processes for the remediation of heavy metals. We are also approved by the MOE for applications of Cement Kiln Dust (CKD) and Phosphate Induced Metals Stabilization (PIMS) technologies.

Screening Mobile Units:

This C of A allows TTK to operate a trammel screen or pug mill to screen, segregate and process metals leachate toxic materials, non-hazardous materials, construction debris, rubble, landfill materials etc. Screening and segregating result in significant waste reduction at the source. Screening also results in very effective on-site treatment processes due to intimate contact between contaminants and remedial additives.

Biological & Chemical Remediation Mobile Units (*ex situ*):

This C of A allows TTK to excavate and treat *ex situ* materials that are contaminated with petroleum hydrocarbons and/or chlorinated hydrocarbons. Applications promote natural biological degradation and/or include the application of a wide array of chemicals (strong oxidizers, reducers, and surfactants).

Biological & Chemical Remediation Mobile Units (*in situ*):

This C of A allows TTK to treat hydrocarbons and/or chlorinated solvents contaminants *in situ* found in soil and/or groundwater. The same biological and chemical agents available for *ex situ* remediation (above) are approved for use under TTK's *in situ* certificate. Treatments may involve the application of non-ionic surfactants, rendering contaminants much more readily available for degradation processes. Degradation proceeds chemically and/or biologically. Chemical treatments may involve using Hydrogen Peroxide, Fenton's Reagent, Modified Fenton's Reagent, Potassium or Sodium Permanganate, or Persulphates. Biological degradation may occur via biostimulation (the application of limiting nutrient formulations) or bioaugmentation (enriching and re-introducing microbes).

Mobile Vapour Extraction:

This C of A allows TTK to treat PCE and/or TCE impacted soils or groundwater by vapour extraction. Dual Phase Extraction (DPE) and Multi Phase Extraction (MPE) technologies can be applied for the removal of dissolved phase, free phase, and vapour phase contaminants from the subsurface.

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Mobile Liquid Waste Management:

This C of A allows TTK to collect, handle, and transport non-hazardous and hazardous liquid waste and non-hazardous solid waste.

Mobile Water Treatment and Discharge C of A (OWRA s. 53(1))

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Mobile Water Treatment and Discharge Units:

This C of A allows TTK to treat hydrocarbon and/or chlorinated solvent impacted water and discharge to the natural environment other than air (ground surface, drainage ditch, or storm sewer). This C of A provides a practical alternative for disposal of treated effluents on sites not serviced by sanitary sewers.

Our many mobile Certificates of Approval only require that we give the M.O.E. ten to fifteen days notice of the commencement of work. This period can be reduced with the agreement of the local M.O.E. office.



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RECENT PURCHASE BY TERRATECHNIK: Geoprobe® Model 420M

Terratechnik has added to its impressive fleet of equipment for complex remediation projects. We have purchased a Geoprobe direct push drill rig. The main benefit of this rig is its versatility in the field for **injecting treatment solutions** into the subsurface. Additionally, the rig will be useful for assisting in monitoring remediation progress by the collection of discrete soil samples.

The Geoprobe 420 M is ultra-portable and fairly lightweight rig allowing us to access difficult to reach areas (eg. fits through standard doorway). This powerful little machine was designed specifically to be durable yet as lightweight as possible. At 20 in. wide, 62 in. tall (folded), and weighing less than 425 lb., the 420M **can be manually lifted** and carried to remote sampling locations. It can also be deployed to hard-to-reach and narrow sampling locations.



The rig will be employed by Terratechnik staff to inject treatment solutions such as **strong oxidizers** (peroxides, persulphates, permanganates), nutrients, sugars, and most proprietary formulations on the market today which are designed for enhancing bioremediation. This includes our own in-house blends of bio-stimulants (carefully balanced N-K-P solutions with trace minerals), the full **Regensis Product Line** (ORC®, HRC®, Regenox® etc.), **Adventus Product Line** (EHC®, Remox® etc.). The rig can also be used for injection of **Iveysol®** and other surfactant formulations for enhanced contaminant transfer into the aqueous phase.

Harsh materials are injected using the powerful DP800 (Max 8 gpm and 650 PSI) Injection Pump. The robust pump is also mobile & compact and operates independently of the drill rig.

Injections create **minimal site disturbance**, as probe rods create a borehole of only 2.25" diameter. Solutions can be injected strategically at **targeted depths**. Rods are then pulled back to continue injecting at more shallow soil horizons, as

necessary. Upon completion of an injection location, the rods are completely pulled out and the rig easily moved into position ready for the next injection.

Injection performance can also be ramped up with the aid of **pressure activated injection probes**. The probes force solutions under pressure into the surrounding soils at discrete, pre-determined zones. The probes also contain a back-flow preventer keeping injection material IN the ground and not ON the ground. The unique internal spool design ensures the injection ports do not clog with soil.



Geoprobe® Model 420M Machine:

The Model 420M is a portable and relatively lightweight, hydraulically powered soil probing machine. The unit has a 42-inch (1,067 mm) stroke. The mobile unit can be deployed to extremely hard-to-reach and narrow locations by means of rolling on its two wheels with pneumatic tires. Outriggers are deployed at the back of the frame for stability during probing. The unit is powered using a separate hydraulic power unit via quick-connect hydraulic lines.

(GH42) Geoprobe® Model GH42 Hammer:

Probe rods are driven into the ground with this unit using a model GH42 hammer that has been designed by Geoprobe® Systems specifically for soil probing applications. The GH42 hammer hits at 1800 blows per minute (30 Hz) and delivers forces greater than 15,000 pounds (66.6 kN) per blow to the top of the probe rod (delivered force is dependent upon resistance in the encountered soil). The GH42 is capable of 0-125 rpm bi-directional rotation with 295 ft.-lbs. (400 Nm) of torque. Left-hand rotation is used with hammering for drilling of surface pavement. The primary lower hammer hydraulic seal is specifically designed to be replaceable in the field using only a torque wrench.

(225321) - 2.25 in. Probe Rod System:

This tool system provides the user the probe rods and equipment required to drive the Macro-Core® MC5 Soil Sampling System using 2.25 in. OD by 1.5 in.ID probe rods to depths of 21 feet below ground surface.

(MC5321) - The Macro-Core® MC5 Soil Sampling System:

The MC5 system features a new, aggressive thread design which translates into longer tool wear for the most popular soil sampler in the Direct Push Industry. Our reliable and dependable Macro-Core® tooling needed a facelift to respond to the demand for increased strength and longer tool life. The formula to meet these demands began with designing a larger MC Sample Tube (increased the OD from 2.125 in. to 2.25 in.) which led to beefing up the thread design. These improvements to the already robust Macro-Core® sampler make a great product perform even better in the field. The MC5 parts can be used with all Geoprobe® brand machines. Macro-Core® MC5 parts that have been redesigned with a stronger thread system include cutting shoes, sample tubes, and drive heads.

PortaCo Hydraulic Power Unit:

The G20-S12-58-W PortaCo Power Unit has a 20 HP Briggs and Stratton V-Twin Vanguard engine. The system is rated for 12 GPM at 2000 psi. The unit includes hand throttle for variable flow (8-12 gpm). The power unit is mounted on 16-inch tires for ease of transportation over rough terrain and through yard gates. The unit has a 5-gallon fuel tank and 5- gallon hydraulic oil tank.

Hydraulic Hoses / Quick Connects:

Two (2) fifty foot (50 ft.) high flow, 0.75 inch braided hydraulic hose complete with all fittings and quick connectors are used for attachment to the power unit.

DP800 Injection Pump:

This robust injection pump, capable of handling harsh chemicals (oxidants) is powered by a reliable Honda Model GXX270 gas powered engine. It is a shaft-driven triple diaphragm, self-priming pump able to deliver liquids at high volume (8 gpm) and high pressure (650 PSI). All pump internals, suction hoses and discharge hoses are also constructed of materials fully compatible with harsh treatment chemicals.