

Solinst®



*High Quality Groundwater and
Surface Water Monitoring Instrumentation*

Our Passion For Innovation and Technological Advancement



Started in 1975 in a small industrial unit in Burlington, Ontario, Solinst has been driven by passion, innovation and determination. Doug Belshaw built Solinst from the ground up, by first reselling geotechnical instruments in Canada. With great foresight, Doug saw the future for a sustainable market in groundwater monitoring equipment. He gradually changed the focus of the company, to one that designs, develops and manufactures a full range of groundwater monitoring instruments sold around the world.



Doug understood his customers' needs and in the early 1980's, provided the first flexible flat polyethylene tape that was marked in feet and tenths. Customers now had immediate access to the engineering scale. In 1982, the 101 Water Level Meter was launched. After many improvements and technological advancements, the 101 still remains as the most sought after Water Level Meter on the market.

In 1984, Jean Belshaw started the Marketing Department, while also teaching full-time as a Marketing Professor at Sheridan College. Jean became the Marketing Manager in 1987, and continued to build the Solinst brand, while cultivating worldwide distributor relationships.

From 1975 to 1988, Solinst operated in Burlington, Ontario. Sarah Belshaw joined the team in 1987 to develop and manage workflow processes and communication, increasing efficiencies and improving customer service.

In 1989, Solinst moved north to the Williams Mill in the village of Glen Williams, Ontario. This 5,000 sq ft facility offered room for expansion. In 1991, Solinst expanded again, adding another 2,000 sq ft. In 1992 and 1993, further expansion allowed for increased production demand.

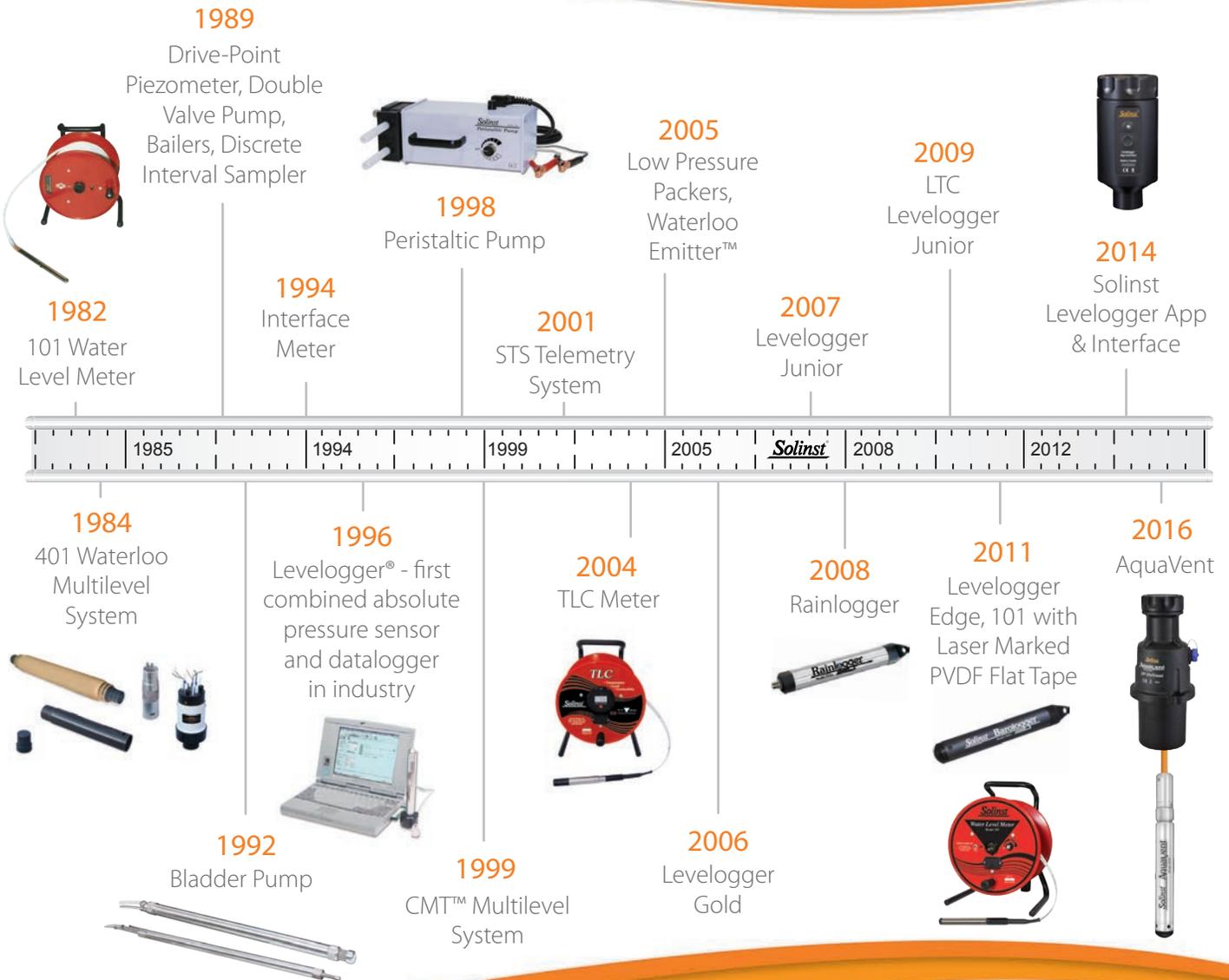
Although Solinst had expanded its total capacity to 11,000 sq ft, the unique setup of using multiple buildings at the Williams Mill presented challenges for growth. In 1994, Solinst purchased a building and property at 35 Todd Rd, in Georgetown. The 24,000 sq ft facility offered a great deal of room for expansion. The land around the facility was also more than adequate for future building development.

In 2003, Solinst expanded the building to 35,000 sq ft. This extra room allowed for increased office space, a separate research and development department, a climate controlled calibration room, as well as a large training and product testing area with indoor test well.

As President of Solinst from 2006 to 2016, Sarah Belshaw continued to drive the company forward, with continual improvements and innovations. Expansion of the building in Georgetown, ongoing investments in R&D and Manufacturing Engineering, combined with in-house design and development of cutting edge technologies for the groundwater and surface water markets, have created the foundations for the future growth and stability of Solinst Canada.



High Quality Groundwater and Surface Water Monitoring Instrumentation





May 6, 2013

Solinst Canada Ltd.

Today, hard work, listening to our customers, and thinking creatively enables Solinst to flourish. We offer a broad range of durable and practical equipment, used by hydrogeologists and hydrologists around the world. The range still features Water Level Meters, but has expanded to a full range of Level Measurement Devices, Dataloggers and Telemetry Systems, Groundwater Samplers, Multilevel Systems, Remediation Devices, and Drive-Point Piezometers.

Solinst is dedicated to the manufacture of high quality instruments, designed for accuracy, ease-of-use and to give reliable results over the long-term. Behind our full range of instruments is the cumulative expertise of hydrogeologists,

engineers, geotechnical, manufacturing and electronic professionals and technicians.

We place great importance on a steady improvement in the product line and the continual development of up-to-date instrumentation. We have a careful quality control program for all of our manufacturing technologies, and ensure we always use the highest quality materials.

In-house technical sales representatives provide fast and friendly service with a high level of expertise and know-how. They are available to discuss your next project, and ensure you get the equipment best suited to your application.

This brochure briefly describes our product line. For more information please contact our office, or visit www.solinst.com



Our Product Lines

Level Measurement Devices

Solinst Level Measurement Devices feature durable, accurately marked cables and tapes, convenient and easy-to-use reels, and full unit repairability. The Meters are ideal for use in rugged environments, excellent for well drillers and environmental field studies for determining depth to static water level, oil/water interface, profiling temperature and conductivity, and for measuring total well depth or top of backfill layers during well completion.

Dataloggers & Telemetry

Solinst dataloggers are ideal for short or long-term hydrogeological studies, or for continuous monitoring applications. The Levellogger Series features water level, temperature, conductivity, and rainfall event dataloggers. Levelloggers use absolute pressure sensors and are able to integrate into Solinst STS and RRL Gold Telemetry Systems for remote monitoring projects. The AquaVent is a water level and temperature datalogger that uses a vented pressure sensor.

Groundwater Samplers

Solinst offers a variety of groundwater sampling options that suit any environment or application, from pumps that provide low flow capabilities, pumps suited to VOC sampling, inexpensive bailers, grab samplers and inertial pumps, to discrete interval samplers. Accessories such as Control Units, 12V Compressors, Filters, and Packers are also available.

Multilevel Systems & Remediation

Solinst Multilevel Groundwater Monitoring Systems are engineered to provide detailed, accurate subsurface data for high resolution site interpretation and assessments, resulting in more effective, and less expensive remediation. Solinst also offers an effective bioremediation enhancement option for cleaning up contaminated groundwater.

Drive-Point Piezometers

Solinst Drive-Point Piezometers provide easy to install wells for long or short-term monitoring applications. Piezometers can be pushed into suitable sediments, or installed with a drill rig for accurate vertical profiling. Drive-Point Piezometers are ideal for initial site investigations and geotechnical studies, and help determine the optimum placement of permanent piezometers or remediation equipment.



Level Measurement Devices



101 P2



101 P7

The **101 Water Level Meters** are very sturdy and give easy-to-read, consistently accurate water level measurements in wells, tanks, and boreholes. The flat tape is permanently marked each 1/100 ft or each millimeter.

There are two versions to choose from. The Model 101 P7 Water Level Meter features a pressure-proof probe and laser marked PVDF flat tape. The Model 101 P2 Water Level Meter features an easy-to-repair probe and heat embossed polyethylene flat tape.

Each well balanced reel has a carrying handle, an easy-access battery drawer, and an excellent brake and tape guide. A 9V battery powers the buzzer and light, which activate when static water is reached. Power reels are available for faster, less strenuous operation of longer tape lengths. There are 110V, and 12VDC motor options on request.

The **Model 101B Water Level Meter** is a basic unit that features a durable, leak-proof 1/2" (12 mm) diameter P1 Probe, and polyethylene flat tape heat embossed in centimeter increments. Length options are 30 m, 60 m, and 100 m.



101B

Level Measurement Devices are accurately marked and provide manual measurements of:

- Water levels in wells and narrow applications
- Oil/water interface and thickness
- Temperature and conductivity
- Total well depth



The **102 Water Level Meter** uses the same electronics and reel as the 101, but has accurate, laser marked coaxial cable. It is ideal for use in narrow diameters or when snaking past down-well pumps.

The flexible cable has a heavy duty polyethylene jacket and markings permanently laser etched every 1/100 ft or each millimeter. A stainless steel central conductor adds strength and limits stretch.

The narrow probes are stainless steel. The P4 Probe is 0.157" (4 mm) in diameter, ideal for accessing narrow diameters, including the channels of a Solinst CMT System. The heavier P10 Probe is 3/8" (10 mm) in diameter, with 10 segmented stainless steel weights for flexibility, ideal for greater depths.

The **102M Mini Water Level Meter** is a very compact meter in 80 ft and 25 m lengths. The reel is light-weight and fits easily into a backpack or a mini carrying case. The cable is marked every 1/100 ft or each millimeter, with a choice of a P4 or P10 Probe.





The 107 TLC Meter (Temperature, Level, Conductivity) displays accurate measurements of conductivity and temperature on an LCD display that rotates for ease of use. Water levels are read off the accurately laser marked Solinst PVDF flat tape when the light and buzzer are triggered.

It is ideal for profiling salt-water intrusion, road salt impairments, tracer tests and to give a general indication of chemical contamination levels. The TLC Meter uses a 'smart' conductivity sensor to read Specific Conductance (displayed as EC).

The tape is permanently laser marked to each 1/100 ft or each millimeter and is available in lengths up to 1000 ft (300 m). A carrying case and tape guide are included.



The 122 Interface Meter measures water and product level and thickness, accurately to 1/200 ft or 1.0 millimeter. It measures floating and sinking hydrocarbon, non-aqueous product layers (LNAPL and DNAPL), using a 5/8" (16 mm) diameter pressure-proof probe. The 122 is certified intrinsically safe, and is ATEX certified.

Readings are taken from accurate laser marked PVDF flat tape up to 1000 ft (300 m). The tape is very easy to clean. The 122 is rugged and simple-to-use. Carrying case and tape guide are included.

The 122M Mini Interface Meter is a more portable version. It is small enough to fit in a backpack, yet rugged and reliable. It comes with PVDF cable in 80 ft or 25 m lengths. It shares the same probe, and certifications as the 122 Interface Meter.



The 103 Tag Line is used to measure the depth to the top of backfill sand or bentonite layers during the completion of a well and to measure the depth to the bottom of a well. It is Ideal for use when installing Solinst 403 CMT Multilevel Systems or 401 Waterloo Multilevel Systems.

The Tag Line uses polyethylene coated, permanently marked, stainless steel wireline and a 3/4" stainless steel weight, mounted on a Solinst reel. A narrow weight is also available. Cable markings are accurately laser etched every 1/4 ft or 5 cm. For higher accuracy, the Tag Line is also available with laser marked PVDF flat tape; markings are every 1/100 ft or each millimeter.

The weights can be clipped on and off the cable or tape. This allows for the reel mounted, marked cable or tape to be used as a support line (i.e. for bailer, pump and packer deployment).



Dataloggers & Telemetry

Levelogger®
Model 3001

All-in-one Dataloggers

- Ideal for groundwater characterization studies
- Excellent for long-term water monitoring in wells, tanks, and coastal and surface water bodies
- Use for remote monitoring applications



The 3001 Levelogger® Edge is a highly accurate water level and temperature datalogger. It is ideal for recording water levels in monitoring and production wells, boreholes, lakes, rivers, tanks, harbors, etc.

The Levelogger Edge has an accuracy of 0.05% FS and a memory capacity for up to 120,000 sets of readings using the data compression option. The datalogger, 10-year battery, Hastelloy pressure sensor and temperature sensor are all factory-sealed in a 7/8" x 6.25" (22 mm x 159 mm) housing with Titanium-based coating for corrosion resistance. The sealed design makes maintenance and cleaning a snap, and offers protection from power surges caused by pumps or lightning.

User-defined schedule, linear, and event-based sampling modes, in intervals from 0.125 seconds upwards for the Levelogger Edge. The Barologger Edge and the data wizard offer the most accurate and easy method to account for barometric pressure.

The Levelogger can be installed with a direct read cable for instant communications, or suspended on inexpensive wireline/cord from a lockable well cap. Leveloggers can also connect to an SDI-12 network using the Solinst SDI-12 Interface Cable. A Biofoul Screen provides extra corrosion resistance.



Biofoul Screen



Locking Well Caps

The 3001 Levelogger Junior Edge is an inexpensive alternative for measuring water levels. It features a memory capacity for 40,000 sets of water level and temperature data points. Accuracy is 0.1% FS. The battery will last up to 5 years.

The LTC Levelogger Edge (Level, Temperature, Conductivity) combines a datalogger that stores 27,000 sets of readings, 8-year battery, pressure transducer, and temperature and conductivity sensors within a sealed 7/8" x 7.5" (22 mm x 190 mm) body with Titanium ceramic PVD coating. The 4-electrode platinum conductivity sensor autoranges from 0–100,000 $\mu\text{S}/\text{cm}$, and calibrates from 50–80,000 $\mu\text{S}/\text{cm}$ with an accuracy of $\pm 1\%$ above 30,000 $\mu\text{S}/\text{cm}$, $\pm 2\%$ 500–30,000 $\mu\text{S}/\text{cm}$, and $\pm 30\mu\text{S}$ below 500 $\mu\text{S}/\text{cm}$.

The 3002 Rainlogger Edge is used with Levelogger Software and most standard tipping-bucket rain gauges with a normally-open style reed switch output. It is excellent for use along side Leveloggers to measure the local precipitation.

The AquaVent uses a vented pressure transducer to provide accurate datalogging of water levels that are automatically compensated for barometric effects. The vented cable connects the downhole logger to a Wellhead that fits conveniently onto a 2" (50 mm) well casing. Custom vented cables are available to 500 ft. The AquaVent can be used with Solinst Levelogger Software, and has the option to communicate using SDI-12 or MODBUS protocols. For permanent moisture protection, the Wellheads and AquaVent logger contain built-in desiccants and hydrophobic filters. User-replaceable batteries can last up to 8 years.





The **9500 LevelSender** is a simple, low cost telemetry system that is compact enough to fit inside a 2" (50 mm) well casing. You can connect a Levellogger and Barologger to one LevelSender device. System setup is ideal for adding telemetry to existing Levellogger installations on Direct Read Cables.

The LevelSender uses GSM cellular communication to send data from connected Levelloggers in the field to a Home Station PC database, as well as your smart device using email or text messaging.

Initial set up is done through a user-friendly software wizard at the Home Station. There is two-way communication between remote Levelloggers and the Home Station, allowing remote updates as required.

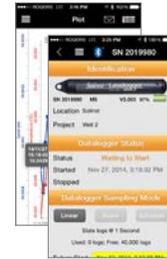
In addition to water level, temperature, conductivity, barometric, or rainfall data, battery level and status updates from the remote LevelSender are received with each data report.



9100 STS Gold Telemetry Systems and 9200 RRL Gold Radio Telemetry combine high quality dataloggers, intuitive software, and wireless communication to create a remote monitoring solution. Solinst Telemetry systems are designed to save costs by enabling the self-management of data, as well as remote collection of the water level data.

®Levellogger is a registered trademark of Solinst Canada Ltd.

™DataGrabber is a trademark of Solinst Canada Ltd.



The **Solinst Levellogger App and Levellogger App Interface** can be used to program, view, or download data from a **Bluetooth®** connected Solinst datalogger on your iOS or Android™ smart device. The Solinst Levellogger App is available free on the App StoreSM and on Google PlayTM.

The App allows you to e-mail and share data logs right from your smart device. To communicate with the Solinst Levellogger App, dataloggers are connected to the Levellogger App Interface, which provides a Bluetooth connection between your datalogger and smart device.

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The **DataGrabber™** is a simple, portable data transfer device for use in the field. With one push-button, all of the data stored in a connected Solinst datalogger is copied to a USB flash drive key.



Groundwater Samplers



Portable reel units and dedicated wellheads are available for Bladder Pumps and Double Valve Pumps.

The Solinst 407 Bladder Pump has a durable PTFE bladder ideal for dedication, and ensures no air/water contact during groundwater sampling. Inexpensive, disposable LDPE bladders are also available for short term applications.

Solinst offers 316 stainless steel pumps in diameters of 1" and 1.66" (25 mm and 42 mm). They are ideal for low flow and VOC sampling. Maximum lift capability is 500 ft (150 m). Dedicated systems come complete with well caps and tubing. Portable tubing reel units are also an option.

The 464 Electronic Control Unit regulates the supply of compressed gas to pneumatic Bladder Pumps and Double Valve Pumps. It uses 4 AA batteries and provides 125 psi (250 psi unit also available). Fully automatic preset sample mode options, and up to 99 unique user-created flow rates can be saved. The Controller can also be operated manually, and without batteries.

The 12 Volt Compressor is lightweight and compact, ideal for field use. It uses any 12 Volt DC power source, such as a car or truck vehicle battery. The compressor operates at 125 psi with a 2 US gallon (7.6 liter) air tank rated to 150 psi.

The 408 Double Valve Pump (DVP) is a gas drive pump suitable for low flow and medium flow applications of almost any depth and narrow diameters. It is available in 316 stainless steel in 1.66" or 5/8" diameters (42 mm or 16 mm).

Compressed gas supplied from the Controller pushes down on the water column in the drive line, which is at static level, closing the check valve at the base of the pump, forcing water up the sample line. When operated properly, "drive gas" will never come in contact with the sample water, which produces high quality VOC samples.



The 408M Micro Double Valve Pump has a remarkably small and flexible design. It is a pneumatic pump which operates under the same principle as the standard DVP, but uses coaxial PTFE tubing with stainless steel valves and filter. Small enough to fit in 1/2" (13 mm) tubing and all channels of the Solinst CMT System, the Micro DVP is ideal for low flow sampling in narrow applications. A flow rate of 20 to 200 ml/min can be obtained to depths up to 240 ft (73 m).

12V Compressor



464 Electronic Pump Control Unit





The 410 Peristaltic Pump operates to the suction lift limit, allowing vacuum pumping or pressure delivery of liquids or gases. It is ideal for vapor or water sampling from shallow wells and surface water. The Pump has reversible flow, a variable pumping rate and allows the use of either 3/8" or 5/8" (10 mm or 16 mm) silicone tubing. The power cable clips to any 12 volt DC supply. It can deliver from 40 ml/min to almost 3.5 liters/min. The pump is water resistant, very compact and simple to use, with a handle and one easy-access control.

The 425 Discrete Interval Sampler is excellent for obtaining no purge groundwater samples from below product layers, within product layers, and for sampling at discrete depths in a well. It is pressurized with a hand pump before entering the well. No water flows through the sampler on the way down the well. When the pressure is released, the sampler fills directly from the sampling zone.

The 404 Inertial Pump is ideal for dedication. The pump includes a simple footvalve and length of polyethylene tubing, which is very inexpensive. Sampling to depths of 100 ft (30 m) can be performed by hand. The Inertial Pump is suitable for purging, sampling and developing wells. It easily handles heavily laden, silty water.

The 429 Stainless Steel Point-Source Bailer has an easy sample release device and dual check valves top and bottom. The check valves prevent water at other depths from mixing with the sample during retrieval. Point-Source Bailers are available in 0.5", 1", 1.5" and 2" diameters (12.7, 25.4, 38.1, 50.8 mm), and lengths from 2 ft to 4 ft (610 mm and 1220 mm). The 103 Tag Line with marked cable can be used to facilitate the raising and lowering of the bailer.

The 428 BioBailer™ is a low cost, disposable bailer made of biodegradable PVC. Larger bailers have a 1.5" x 3 ft. (38 mm x 91.5 cm) body to hold more than one litre of sample (1025 ml), while the 3/4" x 3 ft. (19 mm x 91.5 cm) bailers hold 200 ml. The transparent body allows a visual check of contents. A sample release device is included with each bailer.

The 800 Low Pressure Packers are simple, inexpensive and inflate with a hand pump. They come as single or straddle packers and can be lowered into the well from a rope tether or a rigid PVC pipe. The 103 Tag Line can be used as a marked safety line. Available in sizes to fit wells and boreholes from 1.9" – 4.5" (48.3 – 114.3 mm) to a maximum pressure of 50 psi (345 kPa) for the smaller packer and 30 psi (205 kPa) for the larger packer.



425
Discrete
Interval Samplers



404
Inertial Pumps



429
Point-Source
Bailers



428
BioBailer



800
Packers

™BioBailer is a trademark of Environmentally Suitable Products (ESP) Ltd.



Multilevel Systems & Remediation



The 403 CMT® Multilevel System provides the simplicity and low cost of a bundle-type installation, with the benefits of backfilling or sealing around a single tube, with no joints.

The CMT System uses continuous polyethylene multichannel tubing which is custom-built on site with screened intervals at desired sampling zones. CMT Systems are inexpensive and easy to install. In-field design flexibility allows the number of monitoring ports, port locations, and monitoring strategy to be finalized right on site.

Monitor up to 7 discrete zones in the 1.7" (43 mm) System and 3 zones in the narrow 1.1" (28 mm) System. Reliable seals and sand packs can be placed using standard backfill methods, or using sand and bentonite cartridges in the 3-Channel System.

Water levels can be accurately established and samples taken using small diameter portable equipment available from Solinst. Special wellhead seals are also available to allow vapor sampling.

Patented. ©CMT is a registered trademark of Solinst Canada Ltd

Solinst offers CMT training that provides both instruction and hands-on demonstration for CMT construction and installation. Contractors who attend and complete the course are "Trained CMT Contractors" and can be listed on the Solinst website.



Typical 3 or 7-Channel CMT Installation using layers of bentonite and sand backfilled from surface.



Why Multilevels? Multilevel systems provide groundwater samples from multiple depth-discrete levels (ports) optimizing the amount of information obtained in a single monitoring hole. A transect of Multilevel Systems across a site more clearly identifies the area of maximum concentration.



Standard Waterloo System Components, Including Packer, Port (Dual Stem), PVC Casing, PVC Base Plug, and Manifold

The 401 Waterloo Multilevel System allows detailed groundwater monitoring from many zones in one borehole.

The System is modular to allow ports to be located accurately at desired monitoring zones. The zones are permanently isolated by packers or seals and each port is individually connected to the surface.

Ports can be fitted with dedicated Transducers, Bladder Pumps and/or Double Valve Pumps. Alternatively, a port may be fitted with a monitoring tube that is left open for use with narrow diameter portable equipment, such as the 102 or Mini 102 Water Level Meter and a narrow diameter Inertial Pump, a Peristaltic Pump or the Micro Double Valve Pump.

Ports, packers and casing lengths are assembled, as needed, into a water-tight PVC or stainless steel casing string. The modular Waterloo System allows complete customization to each application. Systems can be installed on an angle or vertically. A drilling rig is not necessarily required during installation. Monitoring is fast and efficient, especially if dedicated equipment is used.

Patented.



The 703 Waterloo Emitter™ is a simple, low cost device for the controlled release of oxygen or other amendments to encourage and sustain the growth of microorganisms, required for in-situ bioremediation of contaminated groundwater.

Ideal for the diffusion of oxygen to enhance the bioremediation of BTEX and MTBE. Emitters provide immediate bioavailability of molecular oxygen for aerobic bio-degradation enhancement, with no loss of amendment gas due to bubbling.

Available to fit 2", 4" and 6" (50, 100 and 150 mm) wells and boreholes, the Emitters are easy to install and remove. They do not require constant monitoring and attention or electricity.

Patented.



Drive-Point Piezometers



615
Drive-Point
Piezometers

601
Standpipe
Piezometers

The 660 Drive-Point Profiler allows collection of groundwater samples from multiple points, at discrete zones, in a single drive. This allows a detailed vertical profile with only one drive of the rig. The profiler tip is connected to a Peristaltic Pump which flushes the profiler tip with de-ionized water during driving to prevent cross contamination and is reversed to obtain a sample. It allows detailed plume delineation quickly and inexpensively. An expendable grout tip is available to allow easy decommissioning.

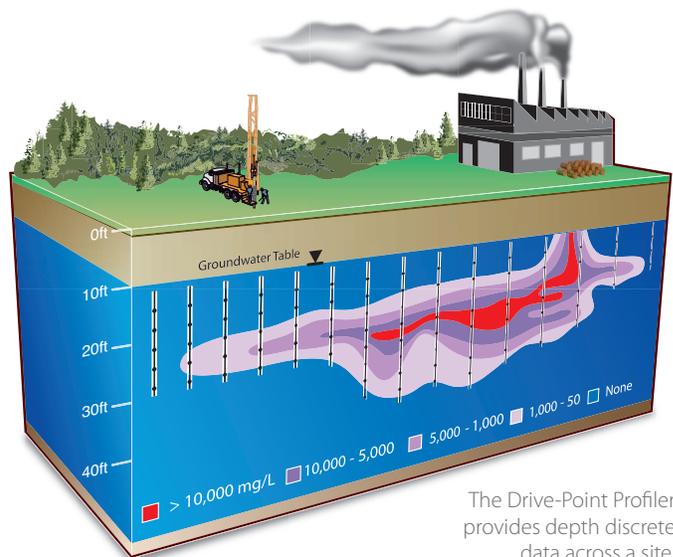


660
Drive-Point
Profiler

Drive-Point Piezometers are ideal for initial site investigations. They provide a low cost, minimal disturbance approach for determining the existence of contaminants in temporary boreholes. Samples can be taken from multiple discrete depths across a site; providing high resolution data, quickly.

The 615 Drive-Point Piezometers are cost-effective for initial site investigations, plume delineations, and as low-cost mini well points. They are excellent for groundwater or soil gas sampling, underground storage tank monitoring, and as sparge points. The stainless steel piezometer point has a 50 mesh screen and a 3/4" NPT riser pipe. An inner sampling tube can be used if higher quality samples are required.

The 601 Standpipe Piezometer is excellent for taking water level measurements. The PVC tip is suitable for pushing into very loose sands at the base of a borehole, or for backfilling in place within test pits and pre-augered holes. It uses a porous polyethylene filter inside a perforated PVC tip which connects to the surface with 3/4" (19 mm) ID PVC extensions.



The Drive-Point Profiler provides depth discrete data across a site.

