Corporate Profile

2011-12

Sovereign
GROUP OF COMPANIES

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Introducing Sovereign Group of Companies

Sovereign is a design, manufacturing and project management company that can create a geological seal for every possible site

Sovereign has been dedicated to the field of water proofing since 1972. Upon realizing the severity of the problems associated with water ingress, Sovereign embarked on a research program which resulted in lodging its first patents in 1974 – our first penetrable yet flexible grout, SCEM66.

Uncontrolled penetration or water leakage into or through waterlogged geological and civil structures as encountered in tunnels and mining excavations can be one of the most annoying, difficult and costly problems faced by engineers and operators. Sovereign pioneered high pressure injection grouting and have since perfected on-site control over these polymeric emulsion grouts.

Reactive grouting, dealing with difficult inflows is our Forte but through research we have embarked on several Pre- Grouting and curtain designs – sealing a geological formation prior to excavation. The benefit of predictable hydro-geological conditions before shaft sinking is of great importance to miners – keeping your project and costs on track.

Sovereign specializes in the sealing of **high flow / high pressure** water inflows. Our quick set grout has sealed single leaks flowing at rates of 2600 Gallons per minute. Water inflows with pressures of 2500 P.S.I. have also been successfully sealed in very deep South African mines.

Sovereign is a design, manufacturing and project management company that can create a geological seal for every possible site – leaking oil well, mine or tunnel. “We analyze the geotechnical information, consult with the client’s engineering and operations staff and then design a site specific grout formulation and placement program.”

Sovereign is qualified to report to the **Mining**, **Civil** and **Oil drill** industries.

Sovereign GROUP OF COMPANIES

Sovereign CORPORATION LIMITED

United States Operation

- Sovereign International Inc. USA
  - Civil

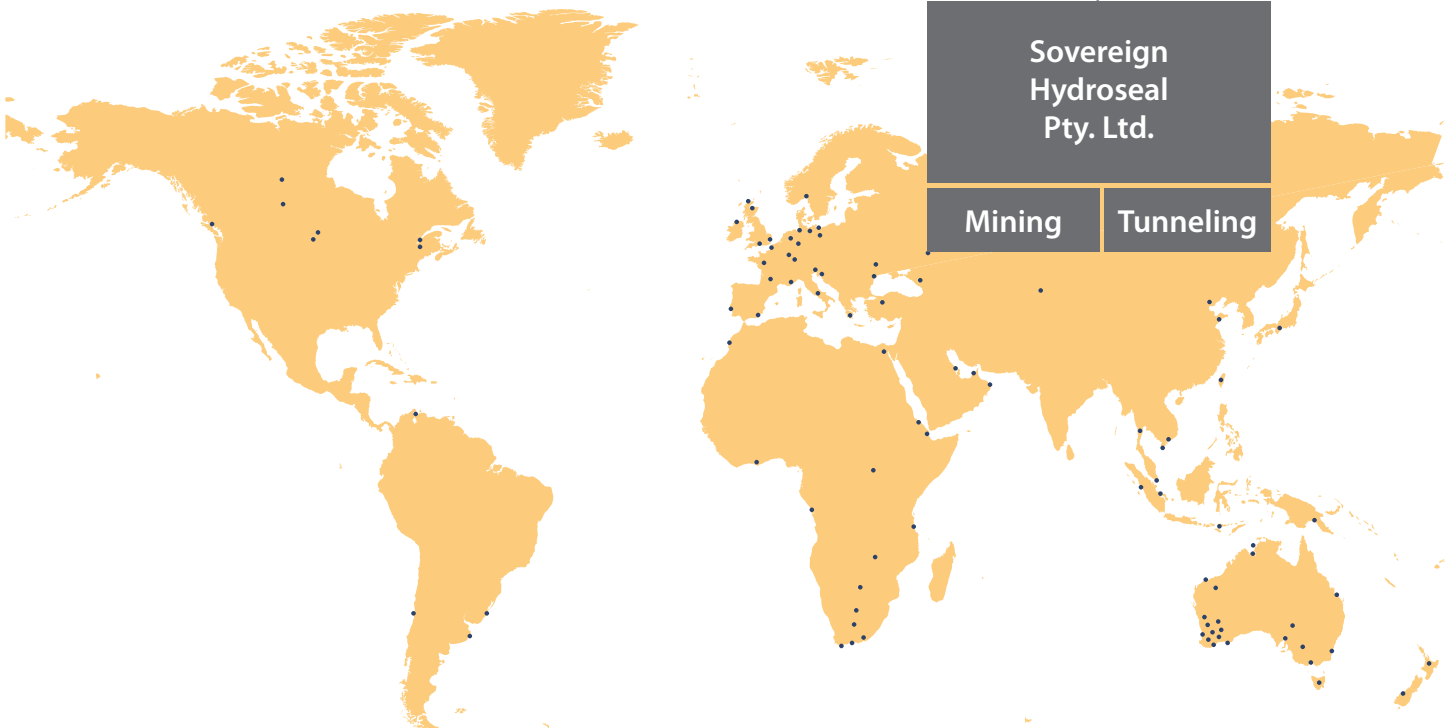
Singapore Operation

- Sovereign Hydro Asia Pte. Ltd.
  - Mining
  - Tunneling
  - Civil
- Singapore
- China
- South East Asia
- Africa

Canada Operation

Australia Operation

- Sovereign Hydro Pty. Ltd.
  - Designs
  - Research
- Sovereign Water Control Pty. Ltd.
  - Civil
- Sovereign Hydroseal Pty. Ltd.
  - Mining
  - Tunneling



Development
Our Future

Sovereign's technology is not limited to water sealing only - we are spearheading the sealing of compressed gasses in large caved structures never achieved before. Sovereign has piloted experimental projects in the USA with partners in the energy resources industry where our sealing technologies were continuously tested in alternative energy trials.

Our grouts were also further developed in North American salt mines where it was demonstrated that all miners can benefit by our flexible and impermeable grouts, even in briny conditions.

Trials are also been conducted using Sovereign's sealing technology for use in the oil and gas industries in on and off-shore applications in the Gulf of Mexico, Canada and the Middle East. Our research team is continuously pursuing tomorrow's technology while creating the ultimate seal.

What We Do

Oil Wells

DRILLING – Lost Circulation.

Lost Circulation due to permeable formations - fissures and aquifers, our grout can achieve a very quick seal getting the drilling back on track.

If total losses occur and circulation cannot be regained, the Sovereign grout Scem66 is a cost effective and dependable solution and is an excellent “squeeze grout”

Our proprietary grout has a very quick set time and no curing is required.

PRODUCTION – Uncontrollable water in oil.

Sovereign has the knowledge and experience to deal with grouting through deep well bores – we understand the mechanics of down-hole packer deployment and selecting packer design, well bottom configuration, perforations and sequencing of grout materials for the best possible solution. Our expert understanding while monitoring injection rates, pressures and detecting permeability changes during grouting, has led to our successes in the past - insuring a consolidated seal is created in any geological structure.

Other well bore grouting activities undertaken by Sovereign: - Grouting of a prophylactic membrane over a salt mine where fresh ground water may erode the salt resulting in sudden mine closures. This was achieved by creating an impermeable curtain membrane within the geological structure above a target zone or salt dome.

Tunnels

Our proprietary grout Scem66 has successfully sealed tunnels during construction - grouting inflows at the excavated face. Repairs and rehabilitation has also been done – some by grouting the rock formation, some by sealing the annulus and some by repairing joints, cracks and other penetrations in the concrete lining. Large inflows during tunnel excavation - up to 3000 Gallons per minute / 11360 Lt per minute have successfully been sealed in a single shift.

Examples of our grout activities in tunnels are the Dartford tunnel in London England, Port Headland Harbor tunnel in Australia, Stone Cutters Island tunnel in Hong Kong, Gwithian outfall tunnel in Cornwall United Kingdom, Queens east side tunnel – New York City USA, Prospect water tunnel in NSW Australia, Hazelbrook sewer tunnel in NSW Australia, to mention a few.

Mining

Sovereign has been sealing ground water inflows since 1972 – some with flow rates of 90 Gallon per second / 340 Liter per second, from a single aquifer and some with static head pressures of 2900 P.S.I. / 200Bar. Our specialty is our proprietary polymer grout that can coagulate in as quick as 3 seconds or as long as several days, depending on the outcome required. This puts Sovereign in the lead when it comes to reactive sealing technologies – no other grouting company can achieve these results and our clients are testimony to our exceptional track record.

We analyze geotechnical reports and design grout programs to suit the client – minimizing downtime getting the miner back on track with minimal disruption. Sovereign also design and perform pre-grouting programs.

Our Core competencies:

- To seal unwanted ground water with no disruption to our clients operations.
- To design pre and post grouting programs.
- To provide our clients with technically advanced quality products and services.
- To provide services complying with all health, safety and environmental regulations.
- To provide our services cost effectively and without delays.

Our Specialties:

- We analyze geotechnical reports and design pre-grouting programs to deal with the area prior to excavation – shafts or declines. This will result in a dry formation prior to mining.
- Sovereign has the most successful reactive grouting system in the world for post excavation sealing.
- During the annual conference of the **'Institute of Shaft Drilling Technology'** (ISDT) held in Las Vegas (1991) a technical white paper was written on Sovereign, our products and systems outlining our capabilities also referring to past case studies.
- Research and development - Currently research and development is taking place in both Canada and Central Africa at some of the wettest underground sites in the world.
- Design Bulkhead sealing technology for worked out mine caverns for Compressed Air Energy Storage (CAES) and Geo – Sequestration for carbon storage.

Products and Services

Scem66

Sovereign produces it own patented emulsion grout and the characteristics of the grout materials are simply phenomenal - penetrable, flexible, adhesive, durable and tough.

- Extremely permeable – considered a Newtonian Fluid with particle size less than 1 Micron.
- Saves money on drilling costs due to super efficiency of grout.
- Viscosity: 1.5 cP while grouting.
- Does not wash out during grouting.
- Exceptional performance under high water pressure – successfully sealed static head of 2900 P.S.I.
- Curing can be chemically controlled from as short as 3 seconds to several days.
- Seals saline and hyper saline water effectively.
- Performs well when pre-grouting shafts declines and pilot holes - due to amenability.
- Possess shear thickening characteristics.
- Remains flexible once solidified and will not re-leak with ground movement – (900% elasticity).
- Excellent adhesion qualities – Bonding Agent.
- Durable – no re-leak occurred during 40 years of grout history.
- Reaction is not Exothermic.
- Environmentally friendly – Non Hazardous and Non Dangerous.

NOH30

This patented dual component system is a mechanical seal that is created whilst pressure grouted into a failed joint or cavernous area - been it a joint or crack. This exiting technology was developed during bulkhead sealing trials in the USA jointly by our North American and West Australian research and development teams. This remote joint replacement technology has endured vigorous high pressure trials with excellent results.

MEMBRANES

Sovereign also use several sprayed applied and seamless surface coatings for the waterproofing and protection of concrete and metal. These non toxic engineered coatings are made from high quality, ISO manufactured, asphalt emulsion and blended with proprietary blends of elastomeric polymers that produce products that are rapid curing, easy to apply and contain no VOC's. This range are formulated for strong adhesion to a wide range of surface materials and give excellent UV resistance, as well as containing aging and cracking from thermal cycling corrosion and building motion, helping industry solve corrosion and water ingress problems in a safe environment.

Past Projects

Sovereign has successfully sealed more than 200 underground sites in 37 countries during the past 40 years

- 20 + Shafts pre-grouted
- 60 + Shafts repaired by means of reactive grouting during excavation
- 30 + Shaft lining repairs
- 30 + Tunnels sealed – Curtain and Reactive grouting of excavations
- 10 + Tunnel maintenance repair of leaking linings
- 50 + Underground sites - Mining, Civil & Oil drill sites: Formations, Aquifers Prophylactic Grouting, Cofferdams, Dam Walls, Fault Zones, Paleochannels, Ore Bodies, Retaining Walls and Excavations, to mention a few.

Here are four examples - more available on our websites
www.sovereignhydro.com & www.sovereignmining.com

Monktonhall Colliery – Scotland 1988

Mine: Shaft sealing

A complicated, interconnected network of old workings exist in this area. Water levels within these workings were controlled by pumping from several locations within the basin. Much of this leakage was through passages too fine to be sealed by grouting with cement. Some 220 tons of cement was used during a period of nearly one year without success.

After considering all available options they concluded that Sovereign offered the most cost effective solution.

The Sovereign grout treatment started in June 1988, on which date the water make from the shaft interval was 2880 litres per minute. After grouting the water inflow was reduced by 96%.

Following the successful sealing of No 1 Shaft it was decided to seal No 2 Shaft as well. Work started in August at which time the inflow in the shaft interval was 785 litres per minute. After a short grout program, this water inflow was reduced to 47 litres per minute.

Outfall Tunnel – Hong Kong 1998

Tunnel Sealing

Segments of the TBM tunnel started leaking water during construction. A trial of 20 metres was initially done and the contract was awarded for the remainder of the leaking section. It was agreed that the area from Rings 216 thru 316 will be sealed under a performance based contract and that accurate water measurement was to be done before work commenced. For the application process 168 holes, each 3 metre deep (51mm dia.) were drilled into the lining.

The first stage of grouting was done by injecting directly into the rock face via mechanical packers installed at maximum depth and not behind the tunnel lining. This stage consisted of emulsion grout injection only.

The second stage grouting consisted of packers being removed and re-installed to depth just behind the tunnel lining to inject grout, followed by Portland cement, into the annular gap between lining extrados and the cut ground face. The injection pressures were lowered to 10 Bar/145 P.S.I. for this stage.

Only 10 shifts were allowed for grouting. The final water make measurement was done at the end of the application program and compared with the pre – sealing measurements and a success rate of 95.34% recorded.

Sinclair – Xstrata, Australia 2010

Curtain Grouting

The proximity of the underground workings to the flooded open cut created a concern. The ore could not be removed without eliminating the water intake - it made the underground development unsafe should an underground flood occur.

Dye tests were conducted at the 1300 Level and it was determined that the water was from the flooded open cut 30 meters above the underground workings.

Three ring holes were drilled from the 1300 Level - between the existing open cut and the underground development. All drilling was done under Sovereign direction. This allowed access to the formation and enabled grouting to isolate the underground development from the flooded open pit. Large volumes of water were intersected and **reactive** grouting commenced without delay. On completion a second series of holes were fanned into the dividing formation and grouted – creating an impermeable curtain between the open cut and the area to be mined. Some cementitious grouts were used for rock consolidation during the water sealing program. The present inflows were reduced by 94% while the new development - extracting ore remained dry due to a successful pre- grout **curtain** design.

St Ives Gold Mine, Australia 2011

Pre-grouting

Two new ventilation shafts were planed - Athena and Hamlet. Geotechnical reports indicated that both shafts would be plagued with uncontrollable ground water inflows (40Lt per second / 11Gal per second) at depths 50 to 90 meters.

Sovereign designed a **pre-grout** program which included a suitable drilling pattern with 5 and 7 holes respectively. Grouting was done through drill placed packers - then pressurized to 20 Bar/300PSI. Groundwater was squeezed from the immediate formation, placing an impermeable grout plug inside all fractures and aquifers isolating the planned shaft perimeter from the formation.

No groundwater was intersected during shaft sinking of both shafts and the client's ventilation project remained on schedule and within budget.

Corporate Details

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