TITAN TIMES

2017

YEAR IN REVIEW

PROJECT HIGHLIGHTS

01
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HELPING TO REMEDIATE PORT HOPE, ONTARIO

We are proud to be part of a major remediation project in Port Hope, Ontario as part of a federal-municipal initiative to clean-up and manage radioactive waste in the area. The Project involves construction of a waste management facility and supporting infrastructure for long-term safe management of approximately 1.2 million cubic metres of historic low-level radioactive waste; cleanup and transportation of this waste from various sites within Port Hope to the waste management facility, and long-term maintenance and monitoring. This new facility will include a 16 x 25 m high waste containment mound, six buildings, paved roads/parking areas, a stormwater management pond and a water treatment plant.

Titan will be responsible to install over 900,000 m2 of geosynthetics including HDPE geomembrane, geotextile and Geosynthetic Clary Liner (GCL) which will line three cells that will hold the radioactive waste. Installation is slated for the summer of 2018.

02
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AROMORMAX®—A LONG-TERM SOLUTION TO A REOCURING EROSION PROBLEM IN MANITOBA!

Always seeking to offer new and innovative products, we expanded our Erosion Control product line to include ARMORMAX®, a cutting-edge engineered earth armoring product, composed of a High Performance Turf Reinforcement Mat (HPTRM) with X3® fiber technology and Engineered Earth Anchors™ that work together to lock soil in place and protect against hydraulic stresses. A dynamic long-term erosion control and slope stabilization solution ARMORMAX® is proven to outlast other slope reinforcement methods yielding significant cost savings.

> “ ARMORMAX® IS PROVEN TO OUTLAST OTHER SLOPE REINFORCEMENT METHODS YIELDING SIGNIFICANT COST SAVINGS. ”

In early 2018 Titan will begin work with the Rural Municipality of Stanley in South-Eastern Manitoba on a large drainage swale erosion remediation project involving installation of 38,000 m2 of ARMORMAX® with gabion mattresses. The first ARMORMAX® project in Manitoba and the largest in Canada this product will address an erosion problem that has been on-going for over 75 years. We are thrilled to have provided an effective solution to this challenge and be part of this exciting project.

03
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TE-BXC30 GEOGRID SUCCESS IN SASKATCHEWAN!

Our TE-BXC30 Geogrid is seeing great success in a variety of soil stabilization and reinforcement applications across Canada. In Saskatchewan this product was critical in a few key projects namely land development and road construction.

The development project involved stabilizing and reinforcing agricultural land for development of a rail transfer site and a rail fleet maintenance yard. This involved two projects where over 70,000 m2 of TE-BXC30 geogrid was installed including a portion over the frozen subgrade to provide stabilization for spring thaw. Minimal excavation was required which saved our client both time and money, however the biggest benefit realized was the 30% reduction in granular aggregate.

In the road construction project, TE-BXC30 geogrid was used to stabilize and reinforce weak saturated soils located in areas with a high water table. Our client required a product that would provide high compaction rates for construction and with Titan’s TE-BXC30 geogrid they were able to achieve this very effectively.

04
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SECONDARY CONTAINMENT FOR ALBERTA CRUDE OIL INDUSTRY

This fall Titan began installation of a secondary containment lining system for a 4.8 million barrel crude oil storage terminal facility in Alberta which is part of the Base Line Terminal, a joint venture between Kinder Morgan and Keyera Corporation. This terminal is located at Keyera's Alberta Enviro Fuels facility in Sherwood Park and installation of the secondary containment lining system be completed during the summer of 2018.

05
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LEAK DETECTION SYSTEM KEY TO QUALITY CONTROL IN B.C. POND LINING

Environmental protection continues to be at the forefront of most lining projects making quality control a top priority. With this in mind, Leak Location Liner, a high-performance two-layer geomembrane was found to be the most effective solution to minimize environmental risk for one of Titan's clients in B.C. looking to line a holding pond and reservoir at a metal processing facility. Featuring an electrically-conductive bottom layer, Leak Location Liner was chosen because it can be spark tested allowing for easy leak detection even on wrinkled and non-conductive surfaces.
It also eliminates false positive leak signals and can be retested as often as necessary ensuring liner integrity over time and providing clients with peace of mind.

"Leak Location Liner was chosen because it can be spark tested allowing for easy leak detection even on wrinkled and non-conductive surfaces."

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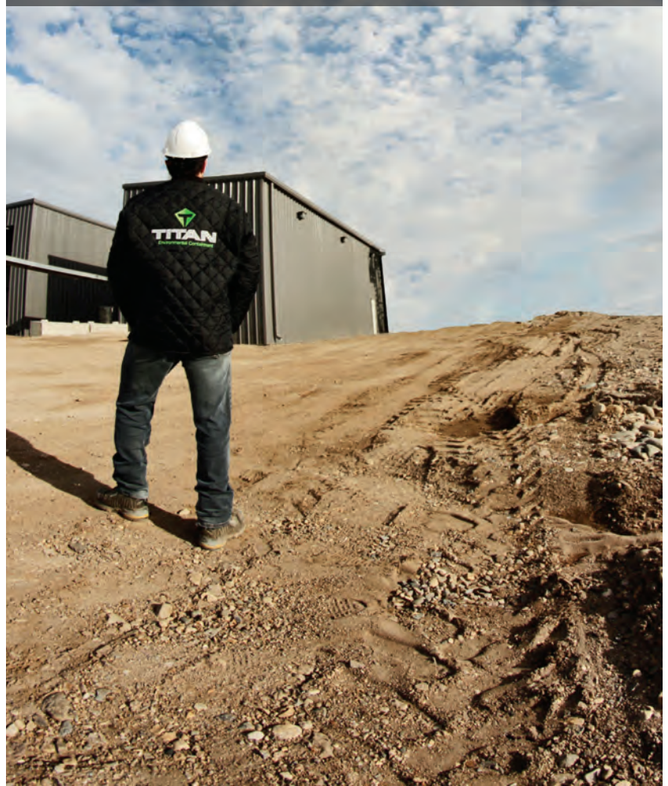
TEAM NEWS & UPDATES

06
—
EXPANDING OPERATIONS IN ALBERTA!

With a focus and commitment on remaining strong Titan is excited to announce that starting in 2018 we will be expanding our Alberta operation. Building on our capacity we will invest in a new location and further grow our team of experienced and skilled field crews.
This will ensure that we continue to service the region to its fullest capacity while remainging true to our core principles—Trust. Quality. Value.



07
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TITAN TECHNICIANS RECERTIFIED

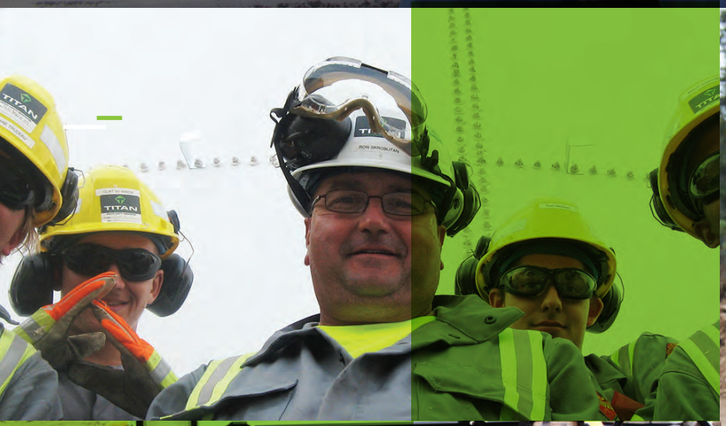
We are happy to report that all of our welding technicians successfully completed their welding recertification through the International Association of Geomembrane Installers' (IAGI) Certified Welding Technician program (CWT) demonstrating Titan's commitment to investing in training and testing to ensure quality on the job. With this certification our clients have the satisfaction of knowing that welding technicians on our jobs have experience in geomembrane welding and meet industry standards of skill for those geomembranes they are certified in.

IAGI developed the Polyethylene, PVC, Reinforced and EPDM geomembrane welder's certification programs so installers could define standards of proficiency, recognize the knowledge, experience and skills of installers, and reward those who qualify with industry recognition. All engineers are encouraged to require that any welding done on their jobsite be done with CWTs.

Happy

RETIREMENT

Ronnie!



Ron,

Eleven years ago you made the decision to partner with us to start Titan. From building tanks in Iraq to lining hog lagoons in Manitoba you spent most of your time in the field ensuring the success of our projects. It's been a wild yet rewarding ride and we are grateful for the role that you played in helping to build the Titan that we know today. We thank you for your vision, commitment and the many laughs over the years which will never be forgotten.

On behalf of the entire Titan family, we wish you the very best in your new adventures.

Brett Kelly

WE CONTINUE TO GROW....

Our team continued to grow leaps and bounds this year as new positions were created and internal vacancies were filled. Here's who joined us:

BRYCE GOEHRING
Business Development Manager

GARRY MCFARLANE
Product Development Manager

TREVOR MILLSAP
Sales Representative (Saskatoon)

KAILYN HILDEBRANDT
Customer Service Representative

EUGENE ARIAS
Civil Engineering Technologist

MANOJ AMUZURI
Project Coordinator/ Estimator

DEAN SAPOON
Project Coordinator (Alberta)

JANELLE HÉBERT
Procurement & Logistics Coordinator (Internal Promotion)

SONJA WILKERSON
USA Sales

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SAM'S GEOGRID CORNER

08
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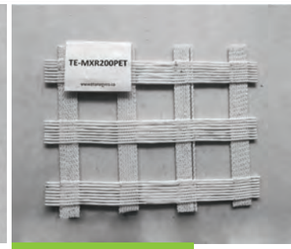
CONTINUED FOCUS ON MINING GEOGRID INNOVATION!

Building on Titan's innovation with TE-MXR PP and high-strength TE-MXR PET geogrids, designed and introduced in 2016 as non-steel solutions for soft and hard rock mining applications, this year we work on further advancements with these products and developed an even higher strength TE-MXR PET geogrid which features varying apertures as well as fire resistant and anti-static coatings to provide maximum roof and rib control in demanding underground applications. We have successfully knitted these geogrids up to 1000X1000 kN/m yielding ultimate tensile strengths. This high tensile strength and stiffness securely confines the mine ribs and roof to prevent rock intrusions. Light weight and corrosion resistant these innovative geogrids have a higher life span and are more cost-effective than conventional steel mesh helping to reduce mine operating costs.

TE-MXR PP



TE-MXR PET

09
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INTRODUCING TITAN CONFORCE GEOGRID

Cutting Edge Concrete Reinforcement

In pursuit of progressive research Titan collaborated with the University of California – Irwine, to conduct testing of our new state-of-the-art TE-SCR100 ConForce Grid for concrete reinforcement geogrid. This testing involved using TE-SCR100 with 25.4" X 25.4'' for structural reinforcement in an 8'' diameter concrete pile and comparing it to conventional steel rebar in another concrete pile of the same size. Testing shows extremely positive results for Titan ConForce Grid. In fact, in Salt-Spray (Fog) Aging tests this geogrid did not exhibit any visual degradation in an ASTM test after 600 hours of exposure. On the other hand, clear evident of corrosion was observed on both steel and galvanized steel rods.

"Did not exhibit any visual degradation in an ASTM test after 600 hours of exposure."

Adding to the ConForce Grid product line, Titan also developed TE-SCR150 ConForce Grid with an aperture of 40mm X 40mm to facilitate free movement of concrete particles and increase the coefficient of interaction and shear strength.

It is well known that that steel corrodes with time and poses a risk to the reinforcement integrity. The primary goal of ConForce Grid is to replace conventional steel as reinforcement for concrete in both aggressive and non-aggressive environments. With higher tensile, flexural and shear strength it offers both better reinforcement and control of surface shrinkage cracking.

TE-SCR100

BEFORE AGEING

TE-SCR100

AFTER AGEING

STEEL ROD

BEFORE AGEING

STEEL ROD

AFTER AGEING

GALVANIZED STEEL ROD

BEFORE AGEING

GALVANIZED STEEL ROD

AFTER AGEING

Sam Bhat –VP Global Business Development & CTO Geosynthetics says, ''This innovative polymeric ConForce grid is poised to take the concrete industry to next level, by increasing the sustainability, durability and offering an environmentally friendly and a cost –effective solution as an alternate to the conventional steel reinforcement."

This summer the City of Calgary successfully installed TE-SCR150 ConForce Grid in ground supported concrete slabs used in concrete pathway with the objective of decreasing costs associated with the concrete itself in addition to yearly rehabilitation work required to repair major cracking that occur in the concrete slabs shortly after installation. By using TE-SCR150 ConForce Grid the City of Calgary was able to reduce the thickness of the concrete slabs from 130mm to 100mm providing savings. This project is being monitored and more data shall be made available in 2018.

For more information about these products contact Sam Bhat at:

sam@titanenviro.ca or 1-866-327-1957.

"This innovative polymeric ConForce grid is poised to take the concrete industry to next level."

GIVING BACK THROUGH R&D

Titan is pleased to have been able to continue our work with post-secondary academia on research and development initiatives benefitting the engineering community. The following are highlights of what we accomplished this year in conjunction with our partners:

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ON-GOING COLLABORATION WITH MONTREAL'S CONCORDIA UNIVERSITY

We are pleased to have received another two-year grant from the Natural Sciences and Engineering Research Council of Canada (NSERC), Canada's federal funding agency for university-based research. Collaborative Research Development program (CRD) to continue our research project with Concordia University. This research is focused on the improving surface water quality using custom developed geotextiles. Efforts are concentrated on in-situremoval of algae and suspended solids from a eutrophic lake using non-woven geotextiles.

In the first phase of this project, different hybrid combinations of customized non-woven geotextiles differing in apparent opening sizes and thicknesses, were tested with lake water and monitored in rea time for surface water quality parameters. In-situ filtration tests are being performed and the results are very promising so far. This method is environmentally attractive since it does not add any foreign materials in the lake water, and is simple and feasible to operate onsite.

2017 TECHNICAL PAPERS

Titan published two technical papers in 2017 which were presented at two conferences. They are:

'Physical Performance of a Bituminous Geomembrane for Use as a Basal Liner in Heap Leach Pad'	*Published in conjunction with the Department of Civil Engineering at Queen's University and presented at Geo-Ottawa 2017 in September.*
'Geotextile Filtration for Improving Surface Water Quality of Eutrophic Lakes'	*Published in conjunction with Concordia University and presented at the CSCE Resilient Infrastructure Conference in London, Ontario in June.*

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NEW RESEARCH WITH QUEEN'S UNIVERSITY IN ONTARIO

This year we performed research examining the physical performance of Bituminous Geomembranes (BGM) for use as base liner in Heap Leach pads with Queen's University. This research was again made possible through another NSERC – CRD grant and focused on examining the performance of a 4mm –BGM with respect to gravel puncture, strain levels, and leakage in a uniquely developed testing apparatus. The research results were promising so far and it was evidenced that the bituminous geomembrane exhibited much lesser leakage than a conventional HDPE geomembrane.

BGMs combine polymer and the highest quality asphalt with puncture resistant polyester reinforcements. This special combination dramatically increases performance in key areas such as mechanical properties, cold flexibility, elasticity, and resistance to the elements. As a result this type of geomembrane consistently maintains its integrity in an ever-changing environment making it a reliable, practical, and durable liner.

"BGMs combine polymer and the highest quality asphalt with puncture resistant polyester reinforcements."


Thank YOU FOR YOUR BUSINESS & SUPPORT.

WARM Wishes FOR THE HOLIDAY SEASON.

WE WILL BE CLOSED FOR THE HOLIDAYS

STARTING AT 2PM ON FRIDAY, DECEMBER 22
AND RE-OPENING ON TUESDAY, JANUARY 2, 2018.

TITAN