

TITAN TIMES

2018 YEAR IN REVIEW



PROJECT HIGHLIGHTS



01

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Hitting The Ground Running In Alberta!

This year (2018) marked an exciting year for Titan as we hit the ground running with the opening of a new location in Leduc near Edmonton, Alberta. Complete with office space, a stock yard for product distribution and an expanded sales and operations team, we made our mark and continued to grow our presence in the province. Our office in Leduc is complemented with an inventory location in Calgary, where we stock a selection of products for regional client convenience.

Contact our sales staff for product information and pricing:

Kris McElhatton: 780-459-0748 (Edmonton)

Bryce Goehring: 403-910-0359 (Calgary)

02

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Channel Lining at BC Hydro's 'Site C' Clean Energy Project

We are pleased to have been selected to work on BC Hydro's Site C Clean Energy Project. Site C involves the construction of a third hydroelectric dam and generating station on the Peace River in northeast B.C. to be used as a source of clean, renewable and affordable electricity in B.C. for more than 100 years. It will provide 1,100 megawatts of capacity and about 5,100 gigawatt hours of energy each year to the province's integrated electricity system.

As part of this project, Titan is lining a two-kilometer diversion channel that will by-pass the dam and be used for maintenance work or during high flow periods.

This channel is being lined with Teranap BGM, a unique high performance elastomeric bituminous geomembrane that combines SBS polymer and the highest quality asphalt for puncture resistance.

The bulk of our work was completed this year and we are returning to the site in early 2019 to complete the next phase.



03

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“Waterblocking” Solution For Outfall Pipe Project

Known for our ability to provide practical solutions to our clients, Titan was the supplier of choice for a water treatment plant outfall pipe installation project on the bank of the Winnipeg River. To install this outfall pipe the contractor needed to hold back river water and blast local bedrock on the riverbank. A product in our Water Control line called WaterBloc proved to be the ideal solution for this application. WaterBloc is a deployable tube-like product made of industrial grade PVC that is water-inflated using the water you are working against. Once inflated it quickly transforms into a dike or cofferdam to hold back water. Engineered for stability, WaterBloc’s safety factor against rolling or sliding is more than 10 times greater than comparable single-chambered products.

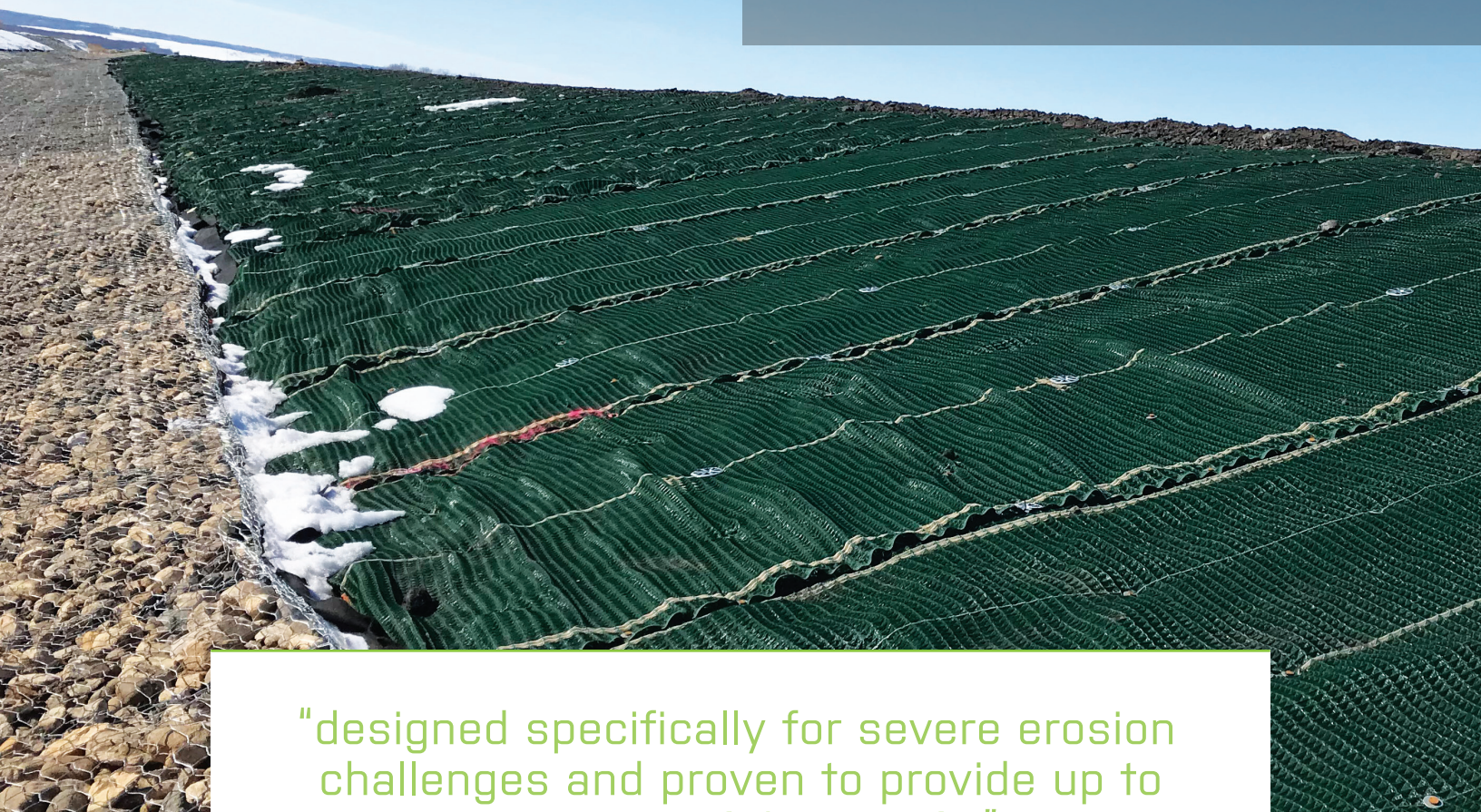
A total of 13 WaterBloc tubes of varying lengths were deployed for this project allowing for successful installation of the outfall pipe.



“Titan was the supplier of choice for a water treatment plant outfall pipe installation project”



Channel Slopes with PYRAMAT® woven three-dimensional High-Performance Turf Reinforcement Mats and Engineered Earth Anchors.



"designed specifically for severe erosion challenges and proven to provide up to 75 years of design life."



View of channel with gabions at the floor base.

04

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Largest ARMORMAX® Installation in Canada

We are proud to have worked with the RM of Stanley in South-Eastern Manitoba on the Reinland Drain Erosion Remediation project which involved the largest installation of ARMORMAX® Engineered Earth Armoring System in Canada, and the first in Manitoba. The Reinland Drain is a large municipal drainage channel that holds and drains intermittent water flow from regional spring melt/breakup and peak discharge events. Failing rock rip rap from heavy run-off flows had been causing reoccurring erosion of the channel slopes—an on-going problem spanning 75 years! The RM was looking for a superior longer-term erosion control solution and engaged Stantec's engineering services.



Vegetation growing through the high-performance turf reinforcement mats.



View of channel with vegetative growth.

Working with Stantec, Titan proposed ARMORMAX®, a product designed specifically for severe erosion challenges and proven to provide up to 75 years of design life. This advanced flexible armor consists of PYRAMAT® woven three-dimensional High-Performance Turf Reinforcement Mats (HPTRM) with X3® fiber technology, and Engineered Earth Anchors (EEAs) that work together to lock soil in place and protect against hydraulic stresses. The project involved placing gabion baskets filled with rock on the base floor of the channel and installing a total of 38,000 m² of ARMORMAX® on the channel slopes.

Being a winter installation, the extreme cold conditions made it challenging to penetrate the frozen ground with the system's B1 Anchors and 5mm 18" spikes. Our installation crew quickly adapted and switched to 10mm- 12" pins which were within the acceptable specification range and allowed for successful installation. The channel was later hydroseeded by another contractor to ensure vegetative growth through the mats—critical to helping lock soil in place and protecting against hydraulic stresses.

After nearly one year we observed outstanding vegetation and continue to monitor the site. As vegetation increases and deeper vegetative root structure forms, we are confident that the system will solidify and perform optimally.

05

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Maximizing Land Development with StormTech®

A private developer undertaking a land development project in a residential area turned to Titan for a stormwater retention solution, and as always we delivered! Confined land space did not allow for a traditional stormwater pond therefore, StormTech®, an underground stormwater chamber system, was selected for this project selected.

StormTech® is an intricate engineered system comprised of polypropylene chambers, aggregate, geotextile, and at times geomembrane. They work together to collect rain water, separate sediment material and allow clean water to percolate into the ground. When it rains water enters the system through a catch basin and is directed to an isolation area where sediment is flushed. As the water rises, it flows out of the isolation area into adjacent chambers where it passes through fabric and trickles back into the ground.



A proud supplier of this system, Titan supplied woven and nonwoven geotextile and approximately 118 cubic meters of SC-310 StormTech® chambers for this project. This solution offered lower overall installation costs, design flexibility, and allowed for development of the land property above while meeting stormwater management requirements.

"Titan supplied woven and nonwoven geotextile and approximately 118 cubic meters of StormTech® chambers"



SAM'S GEOGRID CORNER



06

Titan Takes Third Spot in 2018 Global Geogrids Market!

We couldn't be more thrilled to have taken the third spot this year as a recognized key player in the 2018 Global Geogrids Market. The report released by Industry Research News offers a competitive analysis and ranking of the key players involved in the manufacturing and distribution of geogrids in North America, Europe, Asia (Japan, China, India), Southeast Asia and other regions (Central & South America, and the Middle East & Africa). Results reflect factors associated to the performance of competitive firms such as company overview, product portfolios, SWOT analysis, sales, revenue, geogrids market shares, recent market innovations and developments, and growth strategies that depict the future market potential.

"We continuously strive to enhance the material properties of our geogrids to be the best for their designed applications with a strong focus on sustainability, long-term serviceability, cost-effectiveness and ease of installation," says Sam Bhat, VP of Global Business Development and Chief Technical Officer of Geosynthetics. "Working closely with our clients; we monitor projects where our geogrids are used to evaluate performance in various conditions, which is key to helping us make further technological advancements."

07

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Taking Concrete Reinforcement to the Next Level with Advanced Geogrid Technology

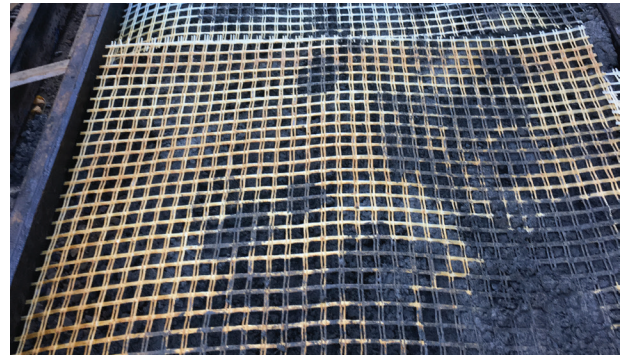
In 2017 we introduced TITAN ConForce Grid, a cutting-edge fiberglass geogrid alternative to conventional steel for concrete reinforcement. The first of its kind, TITAN ConForce Grid can be used in both aggressive and non-aggressive environments offering both control of surface shrinkage cracking in concrete, and structural reinforcement by increasing the concrete's tensile, flexural and shear strength.

Among the first to work with ConForce Grid was the City of Calgary, who successfully installed this innovative product in ground supported concrete slabs for pedestrian sidewalks. Performance was monitored to see how it would cut costs associated with the concrete itself and yearly rehabilitation work required to repair major cracking that occurred in the concrete slabs shortly after installation.

By using Titan ConForce Grid, the City of Calgary is expected to save 12% in material costs in addition to realizing greater long-term savings by increasing the life cycle of their sidewalks. Nearly eighteen months after installation there is no surface cracking in any of the sidewalk sections indicating that TITAN ConForce Grid is performing very well.

For more on this and other Titan geogrids, please contact Sam Bhat, VP of Global Business Development and Chief Technical Officer of Geosynthetics at:

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



"By using Titan ConForce Grid, the City of Calgary is expected to save 12% in material costs in addition to realizing greater long-term savings by increasing the life cycle of their sidewalks."

Up until now this geogrid was limited to flat applications such as concrete slabs, bridge decks and floating slabs because it is produced and placed in sheets rather than rolls to ensure that glass fibers do not break while rolling and unrolling. However, this year we experimented with new materials such as basalt fiber and have developed a second type of ConForce Grid that is flexurally stiff yet can be rolled and unrolled without damaging the fibers. Basalt fiber has a similar composition to glass fiber but exhibits higher resistance in harsh environments. The elastic modulus of basalt fiber is around 86,000mPA compared to 73,000 mPA for fiberglass, and also features a higher melting point. This technological advancement appears promising for a wider range of concrete reinforcement applications mainly curvy structures such as concrete piles where our standard TITAN Conforce Grid can't be used.



No surface cracking after 1 year.

COMING IN SPRING 2019...

TITAN TALK SEMINAR SERIES

Winnipeg, Regina and Edmonton



Get the technical low-down on
innovative products in our line-up.

For more information contact:

Garry McFarlane: 204-878-3955 (Winnipeg)

Jaret Resler: 306-585-1215 (Regina)

Kris McElhatton: 780-459-0748 (Edmonton)

GIVING BACK THROUGH R&D

08

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Continued Partnership With Concordia University

We continued to work with Montreal’s Concordia University thanks to a two-year grant from the Natural Sciences and Engineering Research Council of Canada (NSERC), through the Collaborative Research Development program (CRD). Our research continued to focus on improving surface water quality using custom developed geotextiles.

Building on previous experiments we monitored the use of nonwoven geotextiles with different opening sizes and thicknesses for filtration of lake water. In-situ filtration tests were conducted and presented clogging challenges. These challenges were overcome by using a custom made hybrid combination of woven and nonwoven geotextiles with controlled opening sizes. We hope to present a technical research paper detailing the findings of this study at a conference in Toronto in June, 2019.



Close up of Titan’s new TE-FGP11-EPM geogrid showing desired melt of the bonding layer upon paving.

09

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Additional Research with Queen’s University

Titan continued the NSERC collaborative research and development grant project with Queen’s University to evaluate the performance of bituminous geomembrane (BGM) in mining applications. More research was conducted this year to evaluate the seam quality and ageing strength of BGM seams in comparison to those of conventional HDPE geomembranes. The research also examined the leakage characteristics of BGM and investigated accelerated ageing techniques. The chemical durability of BGM was tested in four different solutions of varying pH values. The conclusions were promising and will be presented in a technical paper in 2019.

10

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Field Testing New High Performance Fiberglass Geogrid

Another leap with Titan geogrid innovation in 2018 involved the development of a high-performance fiberglass geogrid for asphalt reinforcement—(TE-FGP11-EPM). This new geogrid is polymer coated and bonded to an engineered polymeric membrane (EPM) to facilitate stronger adhesion to the asphalt layers. The grid is placed with the EMP side facing up to be paved over.

TE-FGP11-EPM fiberglass geogrid was field tested with the City of Calgary and the City of Winnipeg as part of some pavement rehabilitation projects. We are thrilled to report that the EPM layer fully melted upon paving resulting in strong bonding strength of the geogrid within the asphalt layers.

2018 Technical Papers

We are pleased to have published and presented the following technical papers as a result of our 2018 research and development activities:

The City of Calgary's early Experiences with use of Fiberglass Grids for Asphalt Pavement Rehabilitation.

- Published in conjunction with the City of Calgary –Department of Pavement Engineering, Construction, Roads. And presented at Geosynthetics 2018—2nd International Conference on Technology and Application of Geosynthetics held in Santiago, Chile in October.

Use of Non-woven Geotextiles as Filter Media to Improve Water Quality of a Lake in Quebec, Canada.

- Presented at the IWA World Water Congress & Exhibition 2018 held in Tokyo, Japan in September.

Phosphorus Speciation of Sediments of a Mesoeutrophic Lake in Quebec, Canada.

- Presented at the 8th International Congress on Environmental Geotechnics held in Hangzhou, China in October.

In Situ Removal of Algae and Suspended Solids from a Eutrophic Lake Using Non-woven Geotextiles.

- Presented at the CSCE Environmental Specialty Conference held in Fredericton, NB in June.

Upcoming Events

Look for us here in 2019!

January 2019

- 2019 Edmonton Transportation Works Seminar (Edmonton, AB)

March 2019

- 2019 SARM Annual Convention (Saskatoon, SK)
- 2019 MTCML Trade Show (Brandon, MB)

April 2019

- CEA Transportation Conference 2019 (Red Deer, AB)
- CIM 2019 Convention (Montreal, QC)

May 2019

- 2019 Peace Region Petroleum Show (Grande Prairie, AB)

June 2019

- 2019 Saskatchewan Oil & Gas Show (Weyburn, SK)

September/October 2019

- GeoSt.John's 2019 Conference (St.John's, NFLD)

November 2019

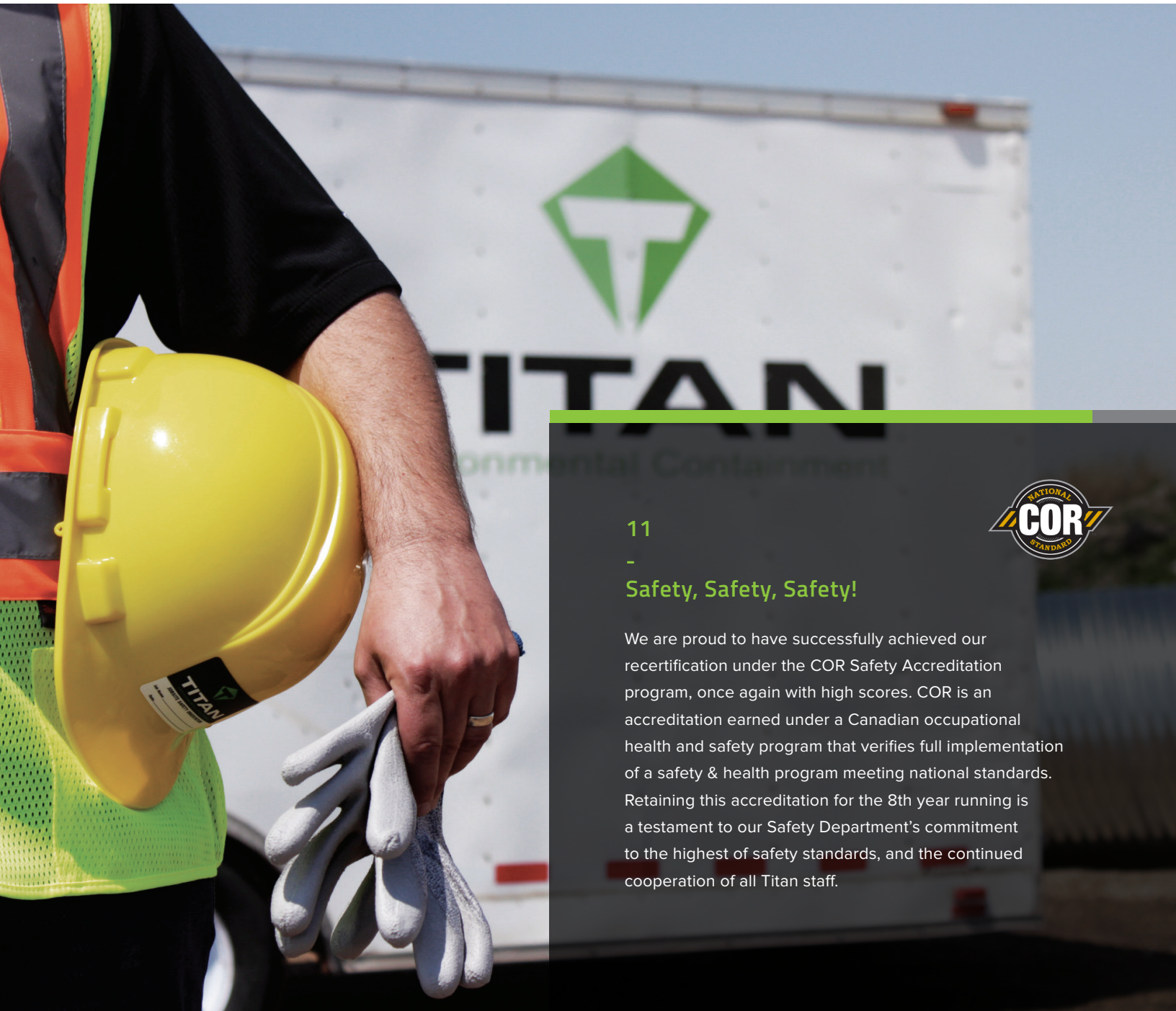
- SHCA 2019 Annual Fall Convention (Regina, SK)
- SARM 2019 Midterm Convention (Regina, SK)
- ARHCA Annual Convention & Expo 2019 (Banff, AB)

December 2019

- MCDCA 2019 Trade Show (Brandon, MB)



TEAM NEWS & UPDATES



11

- Safety, Safety, Safety!

We are proud to have successfully achieved our recertification under the COR Safety Accreditation program, once again with high scores. COR is an accreditation earned under a Canadian occupational health and safety program that verifies full implementation of a safety & health program meeting national standards. Retaining this accreditation for the 8th year running is a testament to our Safety Department's commitment to the highest of safety standards, and the continued cooperation of all Titan staff.



ALBERTA



KRIS McELHATTON
Regional Sales Manager



LISA HUGHES
Customer Service Representative



JOHN McELHATTON
Regional Operations Manager



SHERAN LIYANAGE
Project Support Specialist

Growing Strong!

Our team continued to grow leaps and bounds in 2018. As we expanded new positions were created and internal vacancies were filled. In addition to new installation crews; two in Western Canada and one in Eastern Canada, here's who joined us in our offices.

All Titan staff can be reached at:

1-866-327-1957 or
info@titanenviro.com

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MANITOBA



CHANTAL HEBERT
Accounts Payable Associate



CHRISTINE DUPUIS
Customer Service Representative



DERIC MARTEL
Yard Manager



JEREMY FISETTE
Supply Chain Manager



TYLER HOFER
Inside Sales
**Internal Promotion*

HOLIDAY GREETINGS =& BEST WISHES= FOR THE NEW YEAR



THANK YOU FOR YOUR BUSINESS!

We will be closed from December 24 to January 1, 2019.

TITAN ENVIRONMENTAL CONTAINMENT

