ALBARRIE GEOCOMPOSITES

# REMEDIATION CASE - MINOR SPILL

## TRANSFORMER SUBSTATION

Albarrie

**8/15/2014**

This document contains the information for the remediation of a minor spill within a SorbWeb Plus™ Secondary Oil Containment system for a transformer substation.

July 15th, 2014

Minor Spill Case
SorbWeb Plus
85 Morrow Rd,
Barrie, On.

## Contents

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## 1. BACKGROUND

A catastrophic oil failure occurs when a sudden or unexpected breakdown of the transformer's electrical system, oil storage system, or other primary containment system malfunctions, and oil is released into the surrounding area.

The SorbWeb Plus™ system is a passive oil containment system that will provide sufficient containment of spilled oil as a result of a sudden oil spill following a catastrophic failure of the transformer. In the event that only a minor spill occurs, the system can be quickly and easily remediated to avoid replacement of the entire system. The system is optimized to reduce the economic costs involved in replacing the most important elements of the system. The extent of the remediation and associated cost is limited to the quantity of oil released, and the response time of the remediation.

Should any spill occur, Albarrie Geocomposites must be contacted immediately to appropriately address the situation and develop a response plan.

## 2. TYPICAL DESIGN

The typical design of a SorbWeb Plus™ system may include several components such as:

- Curb structure, concrete block, poured concrete, or excavated earthen perimeter around the containment area to support the liner.
- Impermeable liner around all intrusions.
- Absorbent material.
- Semi-permeable membranes.
- Oil Mat.
- 2x Sand layers.
- Surface/insulating and fire-quenching stones.

In addition to cost saving gained from using The SorbWeb Plus™ systems there are several other distinct advantages:

- Lower maintenance costs
- Not intrusive to the natural drainage across the substation yard
- Design flexibility
- Readily adaptable to accommodate different transformer station layouts and requirements.
- Optimized remediation costs

Albarrie Geocomposites will provide a quote, ship materials, and will schedule a remediation as soon as feasibly possible.

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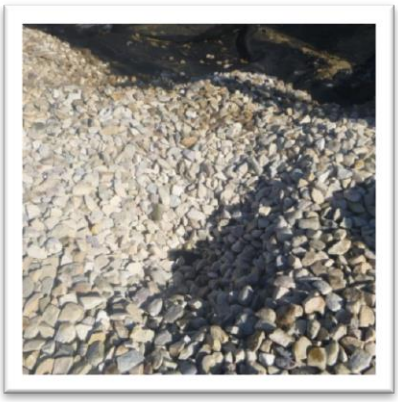
## 3. Sample Case – Remediation of a Spill at Transformer Sub-station

The top layer of surface/fire quenching stone was removed by Hydrovac truck (left). Some areas were dug by hand (right).



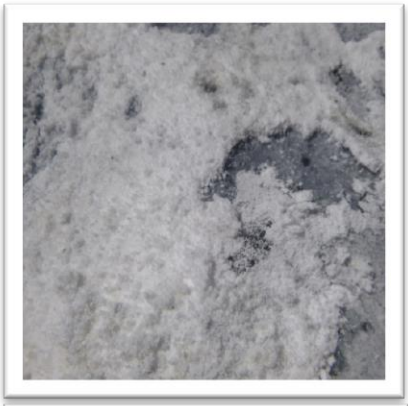
An inspection test area was established in the area that the spill occurred. The top and bottom layers of woven geotextile, the 50mm of sand, and some of the absorbent layer were found to be saturated in this area (left).

Woven geotextiles and sand were removed. The Absorbent layer was rolled up and placed in plastic bags for disposal (right).

The Non woven layer also showed signs of oil penetration in this area and was cut out (left), and turned over (right).

July 15th, 2014

Minor Spill Case
SorbWeb Plus
85 Morrow Rd,
Barrie, On.



The surface of the Albasorb layer had noticeable gelling which indicated reaction with oil (left). However, the Albasorb was not completely saturated, and the oilmat was unaffected.

Typically, areas near the transformer pad will show signs of full depth reaction before areas near the perimeter. Unless oil was released under pressure, areas near the outer perimeter are not as affected.

Pits were dug in other areas in a similar method as described previously.

An area near the transformer pad showed signs that the Albasorb had reacted fully and oil had reached the surface of the oilmat (left).

A small section of the oilmat was cut out, which revealed the underlying sand layer remained unaffected by oil (right).

Some Albasorb was spread on the sand layer, a strip of oilmat was placed overlapping the existing oilmat, and more Albasorb was spread on top and around the seams of the new oilmat strip.

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July 15th, 2014

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New layers of non-woven, adsorbent, woven, and sand were installed only over the affected areas where material was removed (left & right). The containment was then re-filled with fire quenching stone and cover stone. (below)

## 4. Conclusions

The Sorbweb Plus ™ secondary oil containment system was an effective containment system for this substation transformer. Any oil that was spilled from the transformer after installation of the containment was contained within the containment area. Any oil which reached the second lowest layer, the oilmat, did not penetrate into to the bottom sand layer, or underlying soils.

Furthermore, this Sorbweb Plus ™ system was optimized to reduce maintenance costs and prevent replacement of the entire system for the minor spill which occurred. During the above minor spill, the oilmat only required replacing in a small area, while other areas required replacement of only some of the less expensive materials, and other areas required no replacement of materials at all.