



SORBNSEAL®
AN Albarrie PRODUCT

CASE STUDY

MINOR SPILL REMEDIATION 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 systems malfunctions and oil is released into the surrounding area.

The **SorbNSeal® Transformer Secondary Oil Containment 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** must be contacted immediately to address the situation appropriately and develop a response plan.

A spill may be reported to **1-844-767-2932** which serves as **Albarrie's** emergency contact number. Within 24 hours of receiving notice of a spill, **Albarrie** staff will review remediation procedures with the client and provide guidance as required.

TYPICAL DESIGN

The typical design of the **SorbNSeal®** system may include several components such as:

Curb structure, concrete block, poured concrete, or excavated earthen berm around the containment area to support the liner.

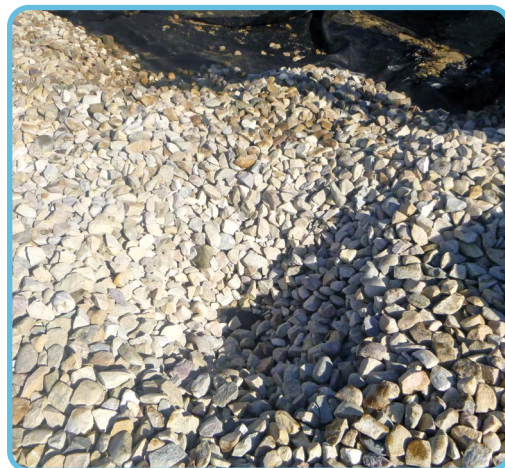
- Impermeable liner around all intrusions
- Absorbent material
- Semi-permeable membranes
- Oilmat
- 2x Sand layers
- Surface/insulating and fire-quenching stones

In addition to cost savings from using the **SorbNSeal®** systems there are several other distinct advantages:

- Lower maintenance costs
- Nonintrusive to the natural drainage across the substation yard
- Design flexibility
- Readily adaptable to accommodate different transformer station layouts and requirements
- Optimized remediation costs
- Albarrie will provide a quote, ship materials, and schedule a remediation as soon as feasibly possible

OIL SPILL REMEDIATION 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, two in. (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 nonwoven layer also showed signs of oil penetration in this area and was cut out (left), and turned over (right).



OIL SPILL REMEDIATION AT TRANSFORMER SUB-STATION *cont'd*

The surface of the **Albasorb** layer had noticeable gelling, which indicated reaction with oil. 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.



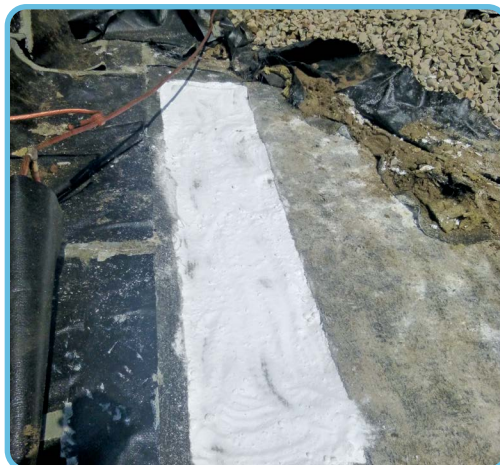
Pits were dug in other areas in a similar method as described previously.

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 that remained unaffected by oil (right).



Albasorb was spread on the sand layer (left). 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 (right).



OIL SPILL REMEDIATION AT TRANSFORMER SUB-STATION *cont'd*

New layers of nonwoven, 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 (bottom right).



CONCLUSION

The **SorbNSeal® Secondary Oil Containment System** was effective for this substation transformer. Any oil spilled from the transformer after installation of the containment was contained within the area. Any oil that reached the second lowest layer, the **Oilmat**, did not penetrate into the bottom sand layer or underlying soils.

The **SorbNSeal®** system was optimized to reduce maintenance costs and prevent replacement of the entire system for minor spills. During this minor spill, the **Oilmat** only required a partial replacement within a small area, while other regions required the replacement of less expensive materials, or no replacement of materials at all.

