

LAB TESTS ON NOCHAR PRODUCT

1.1 TESTS

After some E-Mail correspondence with a technical representative at Nochar describing the oil problem to them, samples of their product with instructions was send to be tested. (Product and test proposal attachment E)

They send three polymers to be tested

- Polymer N910: This polymer will solidify organics/oils, anything with hydrocarbons. It is hydrophobic, so if water is present in the waste stream, the water will be loose.
- Polymer N960: This polymer will solidify water and acid. This polymer was added to the N910 in order to capture any water that may be present in the oil waste stream.
- Polymer N990: This polymer is specially formulated for very old oils with low hydrocarbon content. This is a very expensive polymer and was specially created to solidify tritiated oils.

The purpose of the tests is to establish if the specific oil that we have will be solidified by the polymers that they supplied, and to determine the ratio of oil to polymer that can be applied in the solidification process.

The two methods that were proposed are:

1. Place the polymer in a glass beaker and pour the oil on top allowing the oil to flow through the polymer and be absorbed in the structure.
2. Pour the oil on top and slowly mix the oil and polymer for a few seconds.

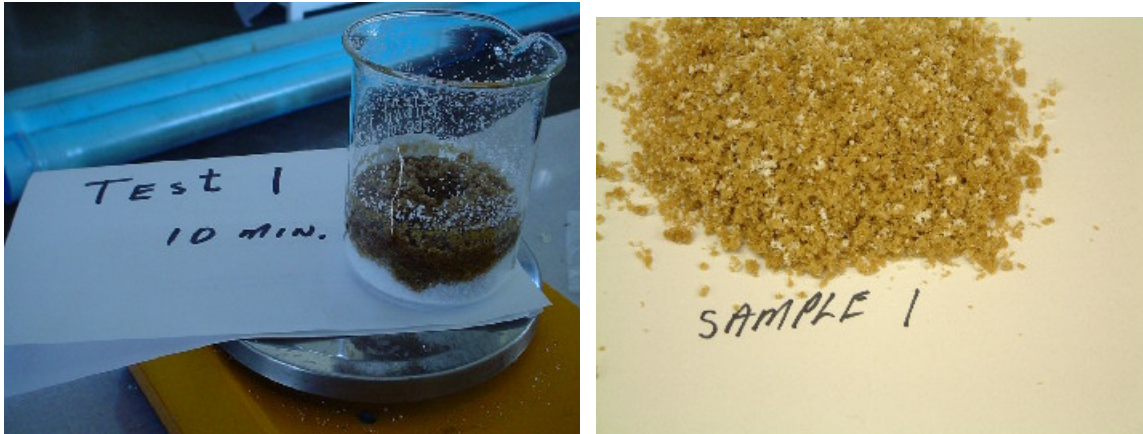
The contents is then removed from the test beakers and placed on filter paper to determine if there is still free oil that has not been absorbed.

1.1.1 Laboratory tests and results

| Sample No. | Solidif. Agent | Waste Charact. (Water & oil ratio) | Nochar (grams) | Oil (grams) | Ratio Oil to Nochar | Process | Comments |
|------------|----------------|---------------------------------------|----------------|-------------|---------------------|---------|---|
| 1 | N910 | No water | 23.7 | 24.2 | 1:1 | Gravity | After 10 min. Oatmeal Texture. Good result |
| 2 | N910 | No water | 24 | 48 | 1:2 | Gravity | Failed: Mixed after 45 min Still oil on filter after 24 h |
| 3 | N910 | 10 % kerosene No water | 10 | 20 | 2:1 | Mixed | Good result Oatmeal texture No oil on filter paper |
| 4 | N910 + N960 | 10% Kerosene No water | 14.5 | 29 | 2:1 | Mixed | Good result Oatmeal texture No oil on filter paper |
| 5 | N910+ N960 | 10% Kerosene + water | 14.9 | 45 | 3:1 | Mixed | Good result Oatmeal texture No oil on filter |
| 6 | N910+ N960 | 10% Kerosene + water | 14.9 | 40 | 2.5:1 | Mixed | Good result Oatmeal texture No oil on filter |

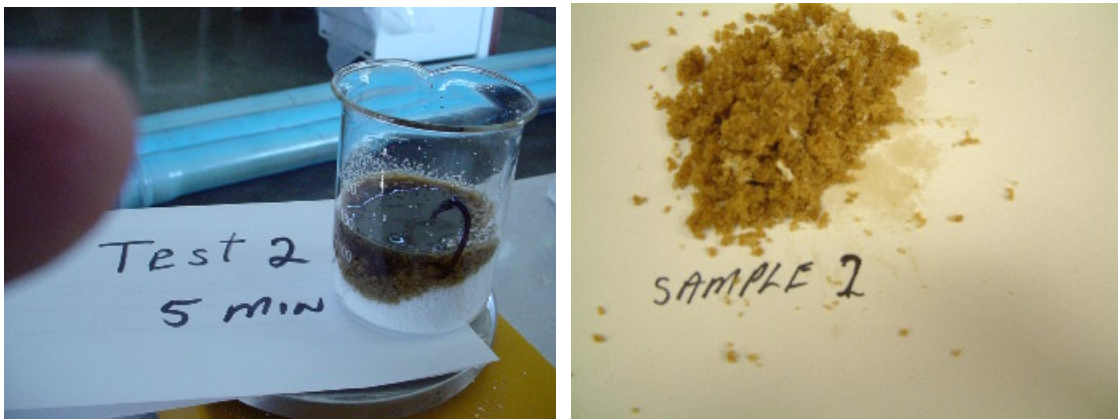
1.1.2 Pictures of tests

1.1.2.1 Test 1: Gravity absorption of oil onto N910 ratio 1:1



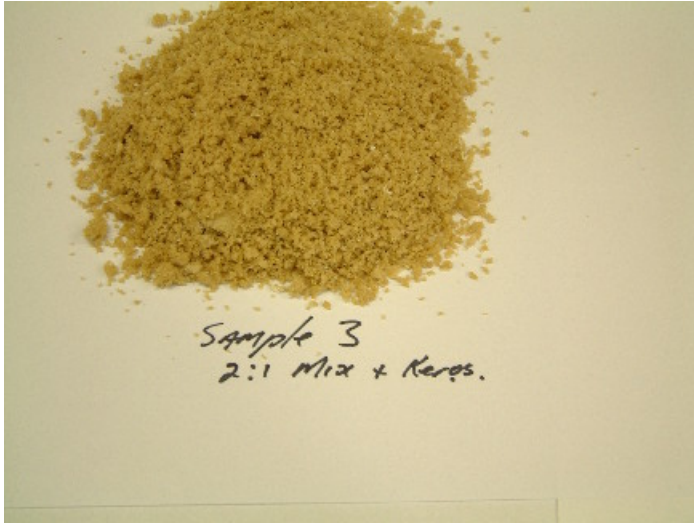
Good result, oatmeal texture with no oil on filter paper after 24 hours.

1.1.2.2 Test 2: Gravity absorption, 1: 2 ratio oil to N910



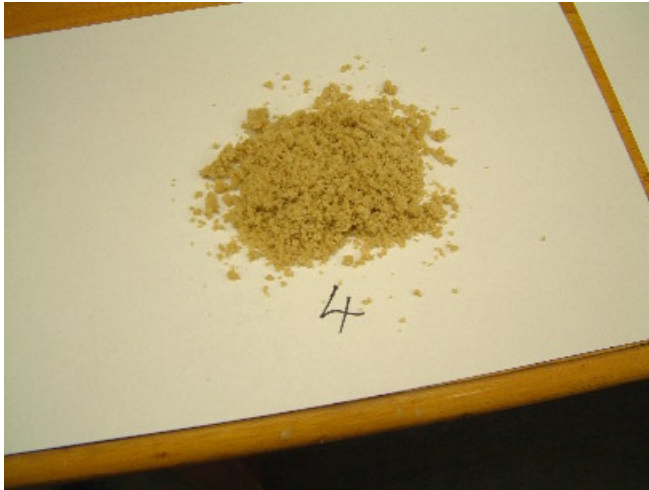
Not successful. Had to be mixed after 45 min. and the mixture was still wet with oil after 24 hours.

1.1.2.3 Test 3: N910 with 10 % kerosene added to the oil and a 2:1 ratio (Oil to Nochar)



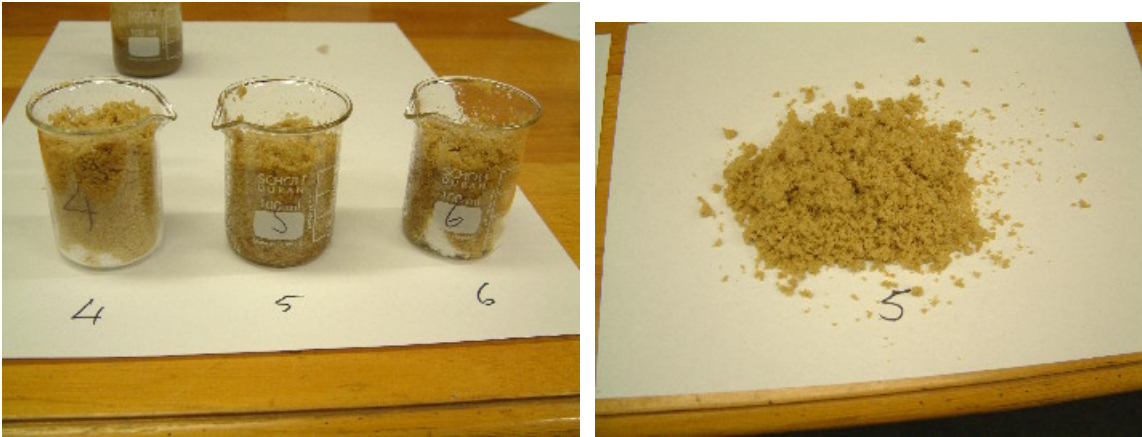
Good result, oatmeal texture with no oil on filter paper after 24 hours.

1.1.2.4 Test 4: Same as Test 3 with some water added to the oil.



Good result, oatmeal texture with no oil or water on filter paper after 24 hours.

1.1.2.5 Test 5: Ratio of 3:1 oil to Nochar with 10% kerosene and mixed.



Good result, oatmeal texture with no oil or water on filter paper after 24 hours.

1.1.2.6 Test 6: As above but a 2.5:1 oil to Nochar ratio



Good result as above with a dry oatmeal texture.

1.2 COST IMPLICATION

With a ratio of 3:1 oil to product we will need about 7,500 Kg's of the product to solidify 30 cubic meter of contaminated oil.

A quote from the supplier in August 2003 indicated that this will cost 207,000 US Dollars (\pm MR1.5) delivered at Necsa, and this will also include a technician to assist with the start-up of the process for 3 days. (Quote Attachment F)

2 RECOMMENDATION

With a relative small volume of oil that must be treated or disposed the costs involved in finding suitable decontamination methods that may or may not be successful must be the evaluated against the cost of direct conditioning and disposal. If we only consider the best waste conditioning method than surely the incineration of the oil is by far the best option. To purchase and licence a facility only for the 30 to 40 m³ of oil may in the end be more expensive than solidification and disposal.

The conditioning and disposal cost using the Nochar product may be in the order of MR2 A further advantage is that ±30 of the R112 UF6 cylinders that must still be decontaminated can be used as disposal containers for the solidified oil.

It is therefore proposed that the oil be solidified with the Nochar product inside the R112 cylinders, and stored in the PEL store for future disposal to a disposal facility