



Common Forum/DD 2016.019

ACID TAR RECOVERY

Synthesis of the answers received after Anan Bohers' request (07/12/2016)

Updated the 31 March 2017

The request:

Acid sludge (also referred to acid tar or goudrons) is one of the main type of oil refining industry waste. It is formed by the purification of petroleum products by concentrated sulfuric acid. Refinery acid sludge is highly viscous tar-like mass that contains heavy hydrocarbons, sulfuric acid and water.

The sludge is accumulated in special ponds close to major refineries. These ponds are designed only for temporary storage of hazardous waste, where it is dragged on for decades. The further existence of acid ponds will lead to environmental disasters.

For Matej Bel University in Slovakia (Department of Environment – Environmental Burden Remediation) I would like to kindly ask you, if you could provide us answer to the following questions in order to obtain an overview on acid tar recovery and to contribute to the process of acid tar lagoon recovery in Slovakia.

Questions:

1. Which organisation do you represent?
2. Are acid tar lagoons present in your country? What is the name of the locality contaminated by acid tar in your country?
3. Are they still present, remediated or recovered?
4. Can you provide details of professional societies which can provide information on processing and recovery of acid tar in your country?

In advance, many thanks for your information.

Kind regards

Anna BOHERS - anna.bohers@umb.sk



BELGIUM / FLANDERS – Bavo PEETERS – 09/12/2016

1. Which organisation do you represent?

OVAM, the Public Waste Agency of Flanders, is responsible for the preparation and enforcement of the policy on soil contamination and remediation (and also the policy on waste, material management and circular economy) in the region of Flanders, Belgium.

2. Are acid tar lagoons present in your country? What is the name of the locality contaminated by acid tar in your country?

Yes. To our knowledge following acid tar lagoons are/were present in Flanders, all in and around the city of Ghent.

- Bieslookstraat, Mariakerke
- Bombardementstraat, Ertvelde
- Papiermolenstraat, Gent

3. Are they still present, remediated or recovered?

Mariakerke

Still present and not yet remediated. OVAM is currently in the public procurement process to assign a contractor. Tasks:

- Desk study on the sustainable remediation of acid tar, taking into account the principles of enhanced landfill mining;
- Setting up a pilot test based on the results of the desk study;
 - Working out a remediation project and the technical contract specifications for a full-scale remediation of the location.

In a next procurement phase, a contractor will be assigned for the full-scale remediation.

Ertvelde

Remediation of three acid tar lagoons by DEME. English information on the remediation can be found on the website of DEME.

<http://www.deme-group.com/references/remediation-total-acid-tar-lagoons-ertvelde>

Interesting youtube movie on the remediation: <https://www.youtube.com/watch?v=jUz7EP0dtms>

Gent

The landfill was remediated, fully excavated and redesigned with a pond by OVAM in the early nineties according to the ex-officio procedure. Contractor was DEC/DEME.



4. Can you provide details of professional societies which can provide information on processing and recovery of acid tar in your country?

Contractors with experience in the remediation of acid tar:

- DEME (pensaert.stany@deme.be)
- SUEZ (adrien.kahn@sitaremediation.com). SITA-movie on acid tar remediation in Wallonia: <https://www.youtube.com/watch?v=F9gKMI0dzZE>
- Jan De Nul
- MUEG

BELGIUM / WALLONIA – Marie JAILLER – 21/12/2016

After reading carefully your questions about acid tar, I give you information about what my company SPAQUE has done recently about this kind of contamination.

1. Which organisation do you represent? **I work in SPAQuE company. SPAQuE is a public company in charge of the remediation of 60 brownfields (orphan sites) in Wallonia, the French-speaking part of Belgium. The main sources of funding are regional and european funds.**
2. Are acid tar lagoons present in your country? **Yes, we have a site with a high acid tar contamination.** What is the name of the locality contaminated by acid tar in your country? **The name of the locality is Mons and Le Roeulx (the site covers 2 municipalities).**
3. Are they still present, remediated or recovered? **The acid tar contamination in soil was remediated by excavation last year.**
4. Can you provide details of professional societies which can provide information on processing and recovery of acid tar in your country? **The company in charge of the remediation works for this site was SITA Remediation (called SUEZ now).**

This kind of specific contamination needs special care for the excavation methodology (due to instability in soil, low pH), for the excavation workers (due to high concentrations in benzene and naphthalene in air during excavation) and eventually for population living around the contaminated site. You can contact my colleague, Claudia NECULAU, who was the SPAQuE responsible for the remediation works (c.neculau@spaque.be). During the ICCS conference in Bratislava in September, 2016, the SUEZ company, represented by Mr Steve LEROI, explained the methodology used on this site during a presentation).



DENMARK - Christian Andersen – 2/2/2017

I have never heard of this type of contamination in Denmark. It might have existed, but at least it has posed no greater problem.

Danish Oil Industry Association might have better and more detailed information. They have the following contact details:

<http://www.eof.dk/Om-EOF/OM/Service/Kontakt>

For Sweden and Finland:

SPIMFAB
SPI Miljösaneringsfond AB
Nybrogatan 11
114 39 Stockholm
www.spimfab.se

Oil Industry Service Centre
Mikonkatu 9
P.O.Box 1405
FIN – 00100 Helsinki
www.oil-gas.fin

GERMANY – Andreas BIEBER – 05/01/2017

The German Federal Ministry for the environment, where I work, is responsible for the legal regulations on soil and contaminated land. The execution of these regulations is the task of the Laender (regions). There are acid tar ponds in Germany, a lot of them in the eastern part of Germany. Many of them are remediated. However, I cannot present numbers.

Information:

<http://mueg.de/en/geschaeftsfelder/environmental-remediation/services/>

https://www.lfu.bayern.de/altlasten/flaechenrecycling/positivbeispiele/doc/kc_saeure.pdf

(in German)



LATVIA – Daina OZOLA – 08/12/2016

I have received your questions regarding polluted sites with acid tar or gudron. To refer to them I can say that it is one of most dangerous kind of pollution Latvia has “inherited” form Soviet times.

Gudron ponds are located 30 - 35 km from Riga, in Inčukalna district. There are two ponds (1.4 ha and 1.7ha) with content of different acid tar wastes (gudron) from 1950 - 1980. During soviet times wastes from oil refinery and pharmaceutical processing and production, medical and perfumery oil production and others were dumped in sand quarries. There were no environmental concerns about possible impacts, pollution of soil and ground water at all.

After Soviet Union collapse, these sites were defined as historically polluted sites and serious studies to remediate these sites started. With support of scientific and technical studies and expertise It is estimated that pollution from tar pounds goes until 70 -90 m deep into ground and groundwater under both ponds are heavily polluted. Furthermore studies and monitoring results indicates that plume of the pollution is moving towards Gauja river and my reach it around period of 20 years.

So you can imagine how serious situation is. Until now we have developed all necessary policy documents, legislative acts, taken all possible actions to put all our efforts to remediate tar pounds which are one of our priorities in remediation list. However costs to remediate such kind and amount of pollution are extremely high. With support of EU funds starting from 2010 project on remediation of Inčukalna tar pounds are still going on today. We do hope that it will be possible to finalize remediation activities till 2020.

More information on Inčukalns tar pounds, studies and remediation process and progress if needed you can ask from State Environmental Service which is involved in this project: vvd@vvd.gov.lv

Hope that this information provided above might help you to some extent.



LUXEMBOURG - Sophie Capus – 1/2/2017

Luckily we have no such facility in our country.

THE NETHERLANDS - Co Molenaar – 6/2/2017

Thank you for the email. As far as I know we do not have lagoons in the Netherlands. Tar especially occurs in former gasworks. In the Netherlands many consultancies are experienced in remediation of it. The Dutch government had a special remediation program on former gasworks. Nowadays they are all remediated. Dutch consultancies with many experiences in this field are:

- TAUW
- Witteveen and Bos
- RHDHV
- Arcadis

If you google those companies you will find more information. Hopefully this will help you further.

NORWAY – Kine MARTINSEN – 09/12/2016

1. Norwegian Environment Agency
2. Not lagoons, but dumped on ground without any other measures. The name of the location is Valløy, Tønsberg
3. The site is currently undergoing remediation. The remediation of the site includes removal of approximately 20 000 m³ of acid tar and 4.000 m³ of Fuller's earth + 70 000 m³ of contaminated soil. The acid tar on this site was just dumped on the ground and has over time moved towards the fjord and also covers the seabed outside the island... The acid tar is sent to combustion (as hazardous waste) after pre-treatment at the site.
4. The owner of this site is Esso Norway AS. The consultants assisting in the clean-up is Arcadis (Belgian), Multiconsult (Norwegian). The entrepreneurs is a fusion of a Belgian (Dec) and Norwegian company (Veidekke) that call themselves Veidec (<http://veidec.info/>)



SLOVENIA - Bernarda Podlipnik - 2/2/2017

In Slovenia, the waste oil refinery in Maribor in the period 1967-1983 tar lagoon (gudron) deposited in the surrounding caves, one of which is the largest in Pesniški Dvor northeast of Maribor. This tar lagoons was finally remediated in 2008.

Followed by process of remediation: In oil refinement process, based on the treatment with sulphuric acid, a bituminous residue, called acid tar, is formed. With such a treatment, linear paraffin molecules (desired fraction) are divided from undesired additions (aromatics, iso-paraffines, heterocyclic compounds). Acid tar is a mixture of liquid, paste-like, and solid hydrocarbons, containing free and bound sulphuric acid.

Waste oil refinery in Maribor land-filled the acid tar into neighbouring dumps, the largest of which is at Pesniški Dvor and is in the process of site rehabilitation. The rehabilitation operation comprises the following: digging out of acid tar along with contaminated soil, their indispensable treatment and recovery to a secondary fuel (acid tar) or into the building materials (contaminated soil), on-site burial of the dump, elimination of existing constructions and making the whole dumping site green.

Recovery of acid tar runs on the processing equipment installed close by the waste dump. Acid substances are neutralised with lime, inactive additions (sawdust, paper sludge etc.) providing adequate consistency (flowability) of recovered product. The process of recovery runs continually and semi-continually and is supported by the process control. Gas emissions (especially of SO_2) are taken by means of adequate suction and directed through alkaline scrubber where they are purified. The secondary fuel obtained according to this process will be used as the energy feedstock in German thermal power station, which uses coal as the basic fuel of comparable properties. Parallel to the recovery process, there has also been established the monitoring system for environmental impacts.

The estimated quantity of waste to be recovered: 17.000t acid tar and 8.000t of contaminated soil.

In the area of Maribor they are known two other tar lagoons to the extent 15 000 tons, will be remediated in the next few years.



SPAIN – CATALOGNA – Eduard MARQUEZ I BARGUALLO – 02/02/2017

Our reply to the questions of your former email to Comoon Forum about acid tars follows:

1. Which organization do you represent?

I represent the Catalan Waste Agency (<http://residus.gencat.cat/en>), a public company attached to the Ministry [of Territory and Sustainability](#) of the catalan government, being [Catalonia](#) one of the autonomous communities of Spain.

Among others, one function of the Agency is the recovery of spaces and soils deteriorated by the uncontrolled unloading of waste or by pollutants.

2. Are acid tar lagoons present in your country? What is the name of the locality contaminated by acid tar in your country?

Acid lagoons are present in Catalonia spread in 10 different locations. They occupy a total surface of 50.250 m² and the total estimated volume is 110.000 m³. One spot that occupies a surface of around 40.000 m² is larger than the other nine, that are from 25 to 4.000 m². Their common origin is the uncontrolled spill of wastes generated in the treatment of waste mineral oils through the Meinken process. This process was used from the 1960s to the 1980s by one single waste treatment company.

3. Are they still present, remediated or recovered?

The majority of the lagoons are still present. Only one spot of 200 m³ has been already remediated (after neutralization it was excavated and put in a landfill for hazardous wastes).

4. Can you provide details of professional societies which can provide information on processing and recovery of acid tar in your country?

Several companies provide soil treatment services (<http://www.arc.cat/sols/listSolsEmpresa.action>) though they are not specialized in acid tar recovery.

We hope this information will be useful.



UNITED KINGDOM – Paul BARDOS – 08/12/2016

5. Which organisation do you represent? [R3 environmental technology ltd](#)
6. Are acid tar lagoons present in your country? What is the name of the locality contaminated by acid tar in your country? [Yes, many former gasowrks sites](#)
7. Are they still present, remediated or recovered? [Some present, some remediated, e.g.
<http://www.theavenueproject.co.uk>](#)
8. Can you provide details of professional societies which can provide information on processing and recovery of acid tar in your country? The link above provides good contacts. [However, also try \[www.claire.co.uk\]\(http://www.claire.co.uk\) and Steve Edgar of Vertase FLI one of the founders of the Remediation Society, in cc to this e-mail, <http://www.remsoc.org>.](#)

UNITED KINGDOM - Birgitta Beuthe – 07/02/2017

1. Are acid tar lagoons present in your country? What is the name of the locality contaminated by acid tar in your country?

Acid tar is present in many industrial countries, including in the UK, as it was a by-product of refining or recycling oil.

You will find information about a specific UK acid tar site following the link below:

- www.theavenueproject.co.uk/

2. Are they still present or are they remediated?

They are being managed in various ways depending on the risk they pose to human health and/or the environment, through monitoring, capping or remediation. The UK reference provides some information regarding the various options.

3. Are you experienced with acid tar recovery/valorisation in order to obtain an oil product?

As acid tar is already a by-product of refining, most usable compounds have already been extracted and recovering more oil is generally not considered feasible. Valorisation as fuel has been occasionally performed but is often limited by the problem of handling the material acidity and the sulphur emissions resulting from burning.

4. Can you provide details of professional societies which can provide information on processing and recovery/valorisation of acid tar in your country?

I am not aware of a professional society focusing on acid tar specifically. The UK and CLAIRE references attached will provide information about the ranges of options available.