

LFG projects in Germany due to the National Climate Initiative by the German Government

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"LFG projects in Germany due to the National Climate Initiative by the German Government"

16th Intern. Waste Management and Landfill Symposium Sardinia 2017, Oct 2nd - Oct. 6th

Wolfgang H. Stachowitz
DAS - IB GmbH

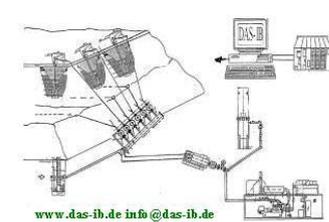
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Biogas, sludge gas and landfill gas technology:

- Consulting, planning, project management
- Training of system operators
- Expert i.a. in accordance with § 29a of the Federal Immission Control Act; and Qualified Person reg. the Ordinance on Industrial Safety and independent expert

Techn. domicile /
Postal address:
Preetzer Str. 207
24147 Kiel, Germany
Comm. domicile /
Invoice address:
Flintbeker Str. 55
24113 Kiel, Germany



Phone: # 49 / 431 / 68 38 14 / 53 44 33 - 6 or 8
Fax: # 49 / 431 / 200 41 37 / 53 44 33 -7

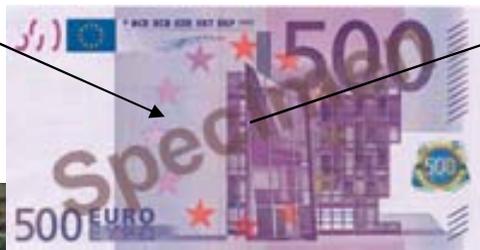
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Emissions of methane: The story of environment and money ..

Methane + O₂ =

+ CO₂



GWP: 28



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Calculations can be done by anyone – experience is the difference

Climate Initiative by the German Government Nationale Klimaschutz Initiative – NKI

Reduction of von greenhouse gas emissions (GHG) by closed MSW – Landfill sites concrete examples of the last 3 years:

LK Grafschaft Bentheim (landfill Wilsum),

LK Fulda (landfill Steinau – Petersberg), Potential analyse finished

AWG LK Vechta (landfill Tonnenmoor), Potential analyse finished / Invest action note in the middle of 2017 positive– call for proposals are just started

LH Kiel Umweltamt (problem site - Kiel Drachensee), Potential analyse finished

Stadtwirtschaft Weimar (landfill Umpferstedt), Potential analyse finished - call for proposals are just started

AWVC Chemnitz (landfills Himmelsfürst and Wittgensdorf), Potential analyse finished / Invest action is requested

RAVON (landfills Kunnersdorf and Nadelwitz), Invest action note positive without any Potential analyse

USB (landfill Kornharpen – 2 portions of the landfill site), Invest action note positive without any Potential analyse

DGSchwarzeElster (landfill Hörlitz), Potential analyse started in August 2017



IPCC – 100 years $\text{CH}_4 / \text{CO}_2 = 28 / 1$ (2015)

100 m³ / h LFG with 40 Vol % $\text{CH}_4 =$

100 m³ / h * 0,4 * 0,7 kg / m³ * 28 =

28 kg / h * 28 = 784 kg CO_2 eq / h =

6.162 CO_2 eq t pa

The organic CO_2 of MSW is zero, because is biologic waste

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Programme of:

Nationale Klimaschutz Initiative – NKI

German federal cabinet dated Dec. 3rd 2014

The programme covers

Approx. 62.000.000 – 78.000.000 t CO₂ eq

That will be approx. 10.000 German landfill projects and we have approx. 450 MSW sites ...

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**Programme of:
Nationale Klimaschutz Initiative – NKI
German federal cabinet dated Dec. 3rd 2014**

Landfill aeration as task to reduce methane emissions:

- **low pressure aeration**
- **high pressure aeration**
- **aeration via over suction pressure**
- **compressed aeration without suction pressure via booster**

So called potential analyses (1st step)

6.10 KLIMAFREUNDLICHE ABFALLENTSORGUNG / POTENZIALSTUDIE ZUR REDUZIERUNG VON TREIBHAUSGASEMISSIONEN AUS SIEDLUNGSABFALLDEPONIEEN

43

Bitte beachten Sie die zuwendungsfähigen Gesamtausgabengrenzen:

Die zuwendungsfähigen Ausgaben für die Erstellung eines Teilkonzepts zum Einsatz geeigneter Technologien zur Reduzierung von Treibhausgasemissionen bei stillgelegten Siedlungsabfalldeponien betragen max. **20.000** Euro. Außerdem sind angemessene Ausgaben für Untersuchungen am Deponeiekörper (z. B. Bohrungen, Feststoffprobenahmen und -analysen, Gasmessungen, Belüftungsversuche), die für die Ermittlung des Emissionspotenzials notwendig sind, zuwendungsfähig. Die Notwendigkeit ist zu begründen. Konkrete Planungsleistungen sind nicht zuwendungsfähig.

Promoted quote: 50 %

In reality in 2017 more than 86 k€ per project for the potential analyses



NATIONALE
KLIMASCHUTZ
INITIATIVE

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So called invest action (2nd step)

3	KLIMASCHUTZ BEI STILLGELEGTEN SIEDLUNGSABFALLDEPONIE	13
3.1	ALLGEMEINE HINWEISE	13
3.2	AEROBE IN-SITU-STABILISIERUNG VON STILLGELEGTEN SIEDLUNGSABFALLDEPONIE	15

Die Zuwendung wird als Anteilfinanzierung durch einen nicht rückzahlbaren Zuschuss in Höhe von 50 Prozent der Ausgaben für Investition und Installation der notwendigen technischen Ausrüstung gewährt.

Förderquote: 50 %

Der Zuschuss ist begrenzt auf 250.000 Euro.

From Oct 2015 on until Sept. 30th 2017:
450.000 € brutto



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So called potential analyses (1st step)

What has to be done on site?

To find out the inventory !

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To measure each well, manifold station etc.



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To measure each well, manifold station etc.

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Measurement at gas wells:

(Les mesures dans les puits de gaz:)

ρ , F, T,

Q: CH₄, CO₂, O₂, H₂S, ...



Measurement on surface:

(Mesure en surface:)

“VOC”

Volatile organic compounds

(Les composés organiques volatils)

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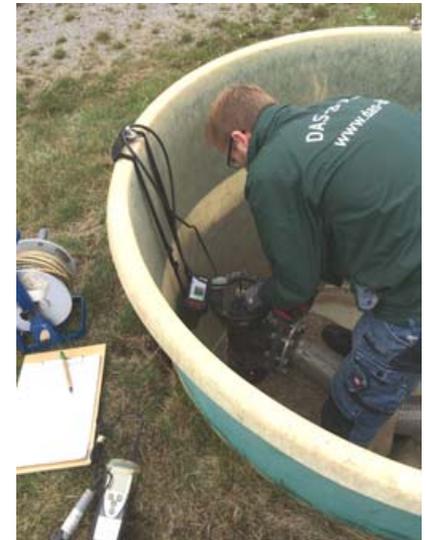
To measure each well, manifold station etc.

No efficiency - without any measurement on site from gas well via surface

Measurement at gas wells:

Level of water & free gas well pipe

To drop a perpendicular

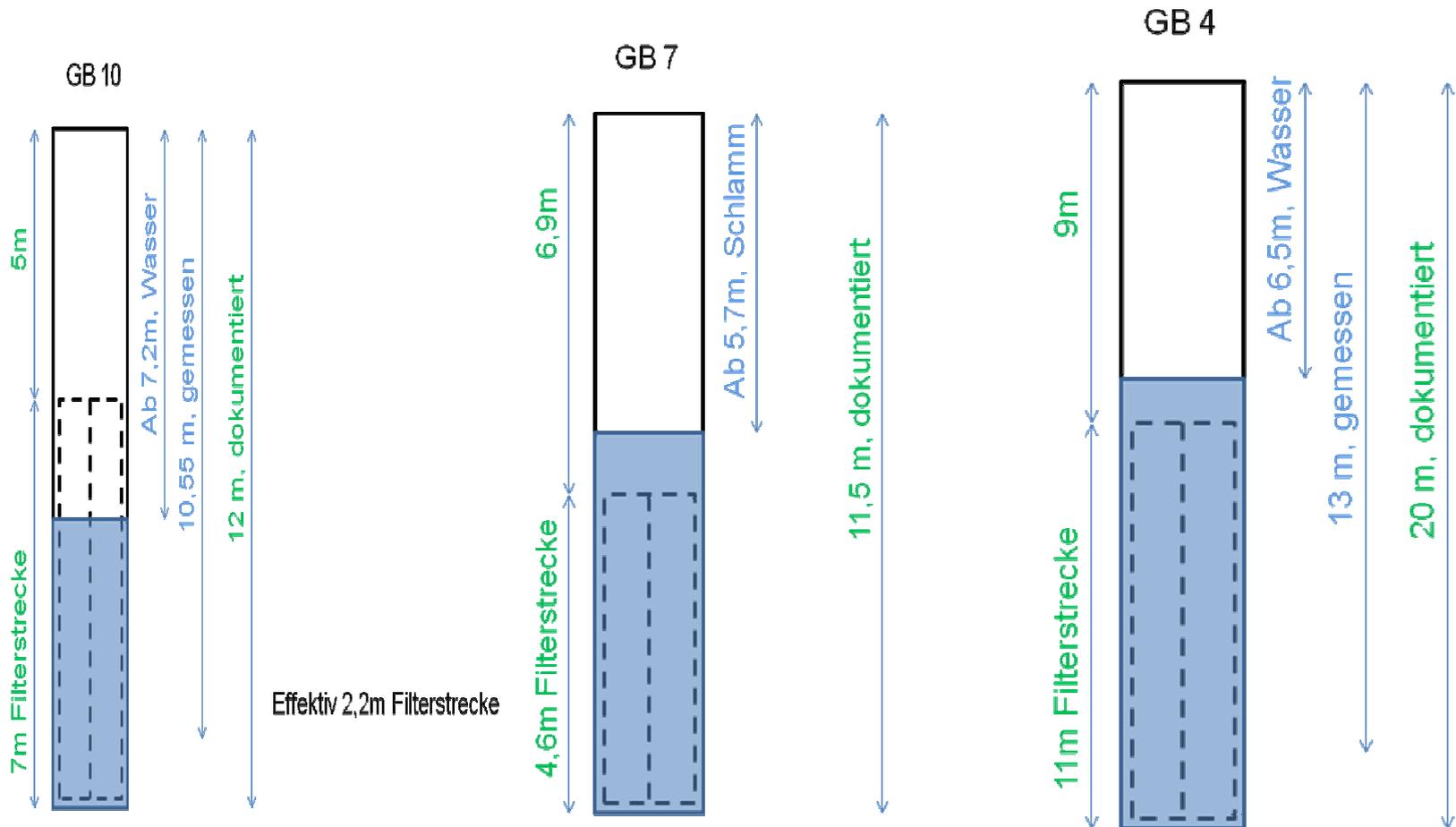


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Water level in gas wells in one of our projects ..



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Sometimes drilling or grabbing

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Sometimes drilling or grabbing

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Sometimes pumping trails



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Sometimes pumping trails



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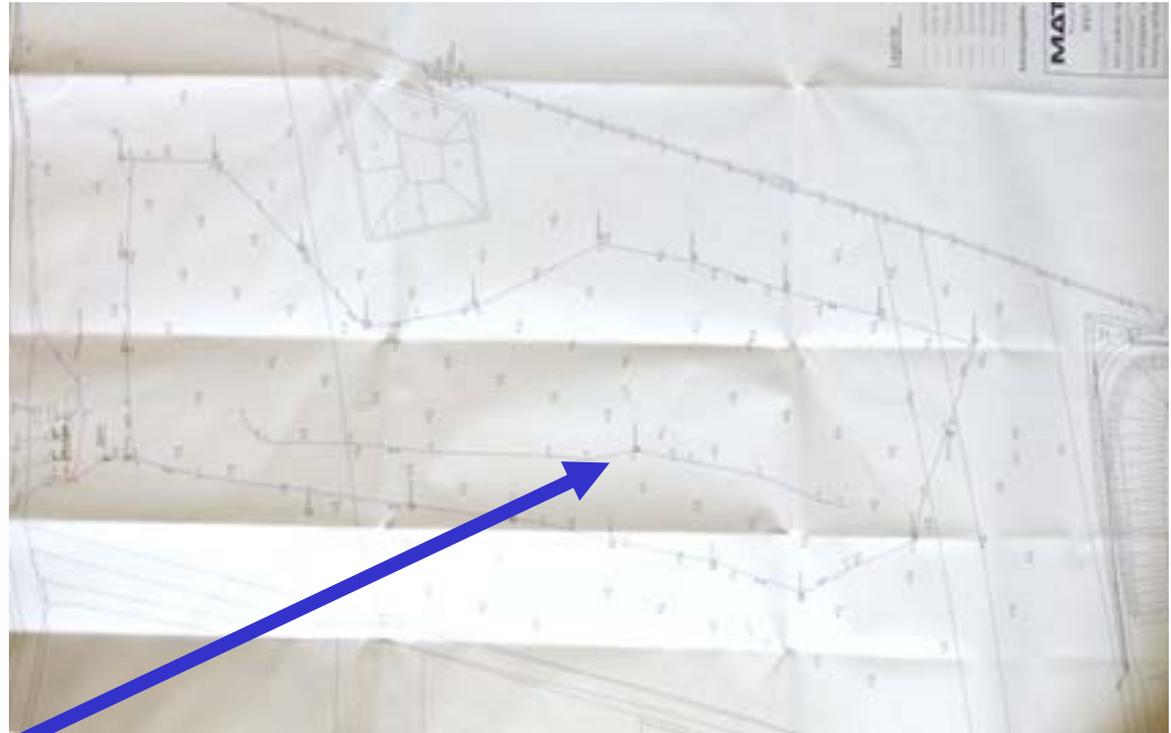
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Sometimes active aeration

Or active air in the landfill – here in central gas well

AERATION



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Sometimes active aeration

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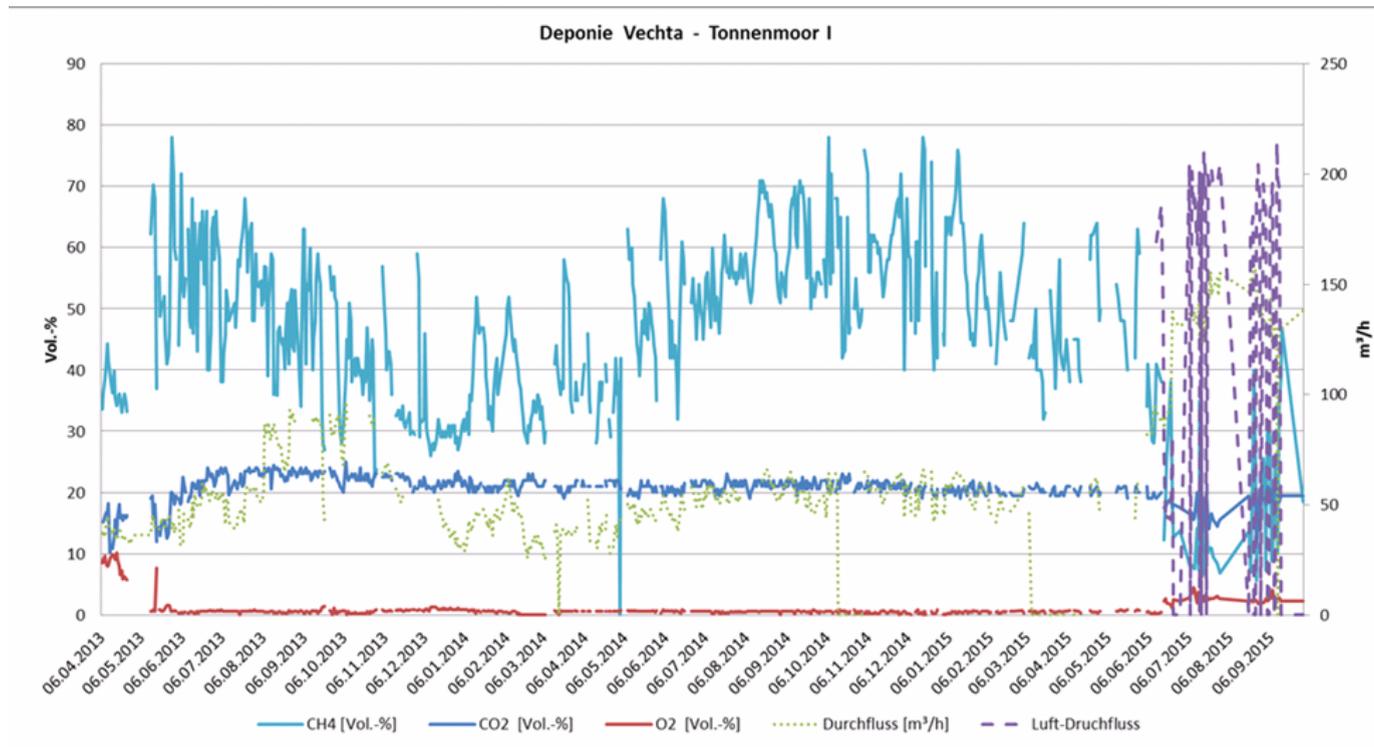
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Sometimes active aeration

active air in the landfill: $\text{CH}_4 + 2 * \text{O}_2 = \text{CO}_2 + 2 * \text{H}_2\text{O}$ **AERATION**



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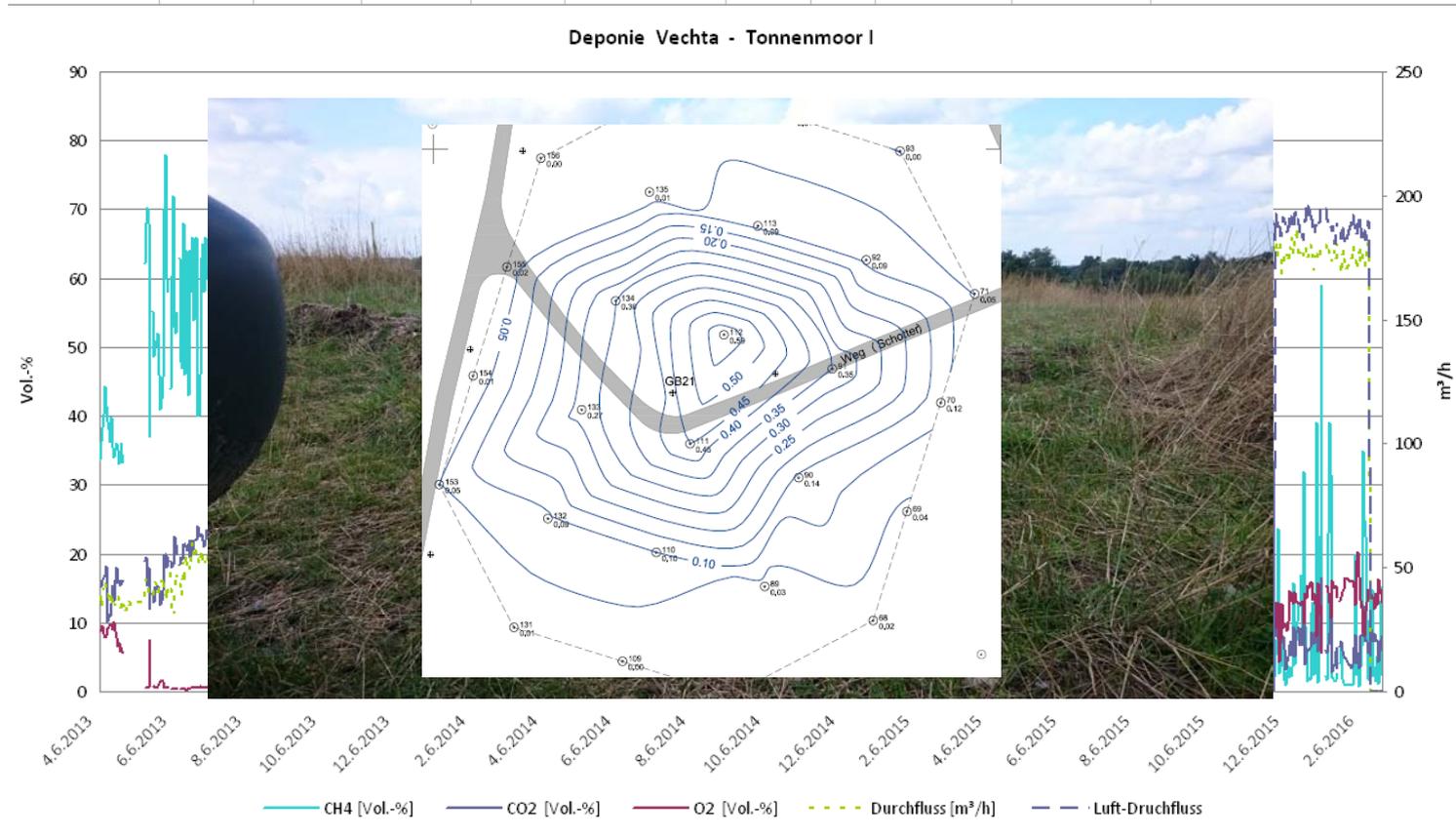
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But take care about settlements ..

active air in the landfill: $\text{CH}_4 + 2 * \text{O}_2 = \text{CO}_2 + 2 * \text{H}_2\text{O}$

Deponiestandort: Deponie Vechta-Tonnenmoor



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Sometimes tests of TOC etc. / gas prognoses

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 **INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE**
NATIONAL GREENHOUSE GAS INVENTORIES PROGRAMME 

2006 IPCC Guidelines for National Greenhouse Gas Inventories

This spreadsheet implements the Tier 1 method for estimating emissions of methane from solid waste disposal sites. For details of the method see the 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 5 Chapter 3

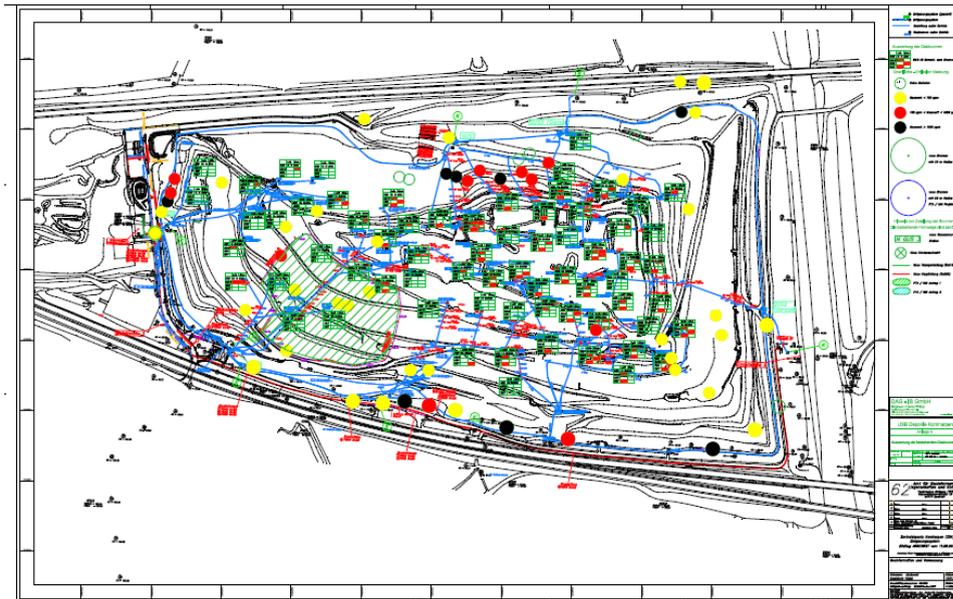
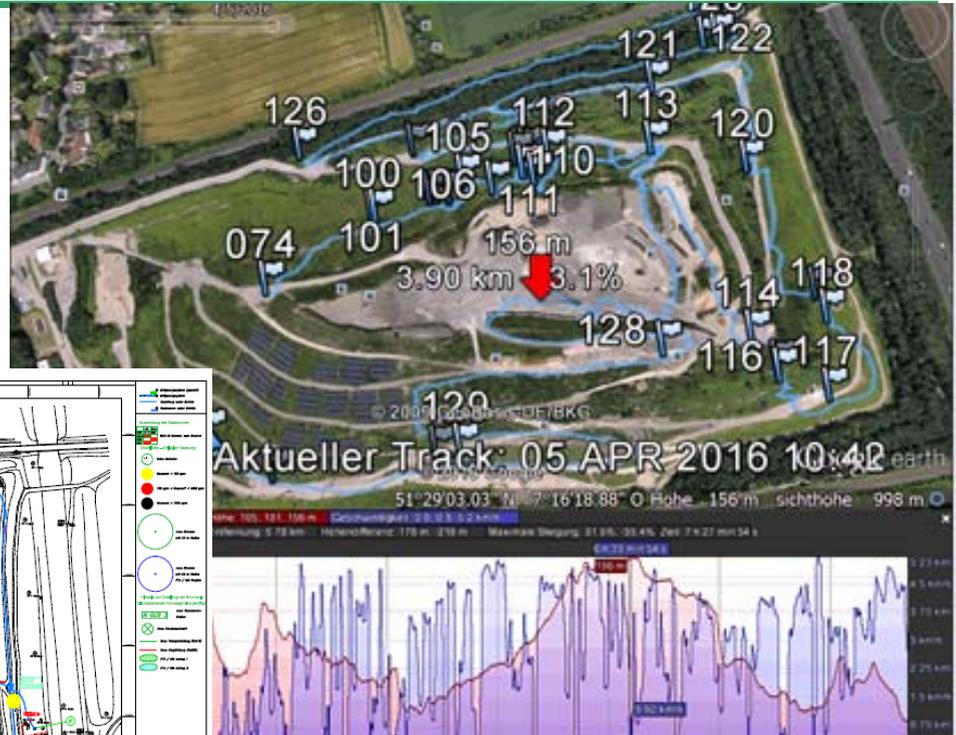
In the landfill body should be ...
max. 12 kg / t oTS „biological
degradable“ (for an invest action)

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And than evaluations

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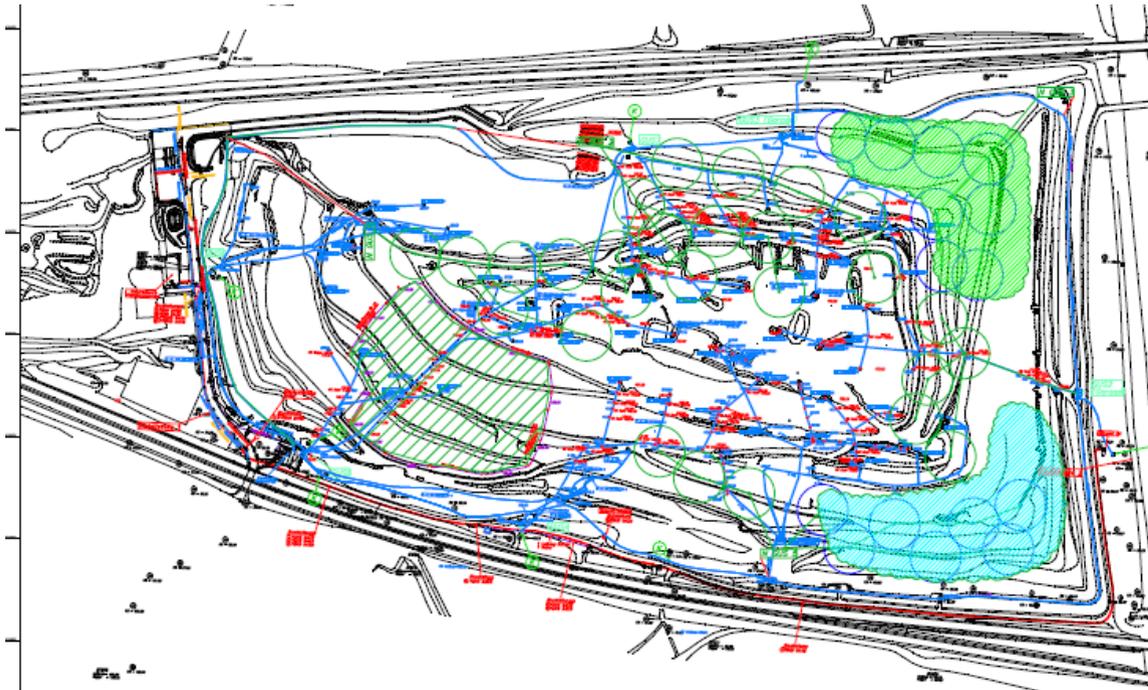


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And than evaluations

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Results ...

The environment find his way



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Results ...

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30 of Donald Trump's wildest quotes



1/31



On climate change

On November 6, 2012, Donald Trump tweeted: "The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive."

On October 19, 2015, he then tweeted: "It's really cold outside, they are calling it a major freeze, weeks ahead of normal. Man, we could use a big fat dose of global warming!"

CREDIT: Jim Young/Kraffers



me at Greenland 2016 - a swim is possible Mr. President

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Any questions left?



Knowledge is key and is available when you know where to find it:

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Or we see us at your site or here e.g. next break