

Description and critical environmental evaluation of the REE refining plant LAMP near Kuantan/Malaysia

Presentation of the main results of the report prepared on behalf of SMSL
Presented at the press conference
Kuala Lumpur/Darmstadt, 26.01.2013



Who we are and what we stand for

Oeko-Institut is a leading European research and consultancy institute working for a sustainable future. Founded in 1977, the institute develops principles and strategies for realising the vision of sustainable development globally, nationally and locally.

Oeko-Institut employs more than 140 staff, including more than 90 researchers at three locations in Germany – Freiburg, Darmstadt and Berlin.

Based on value-oriented research, the institute provides consultancy for decision-makers in politics, industry and civil society. Our key clients are ministries and federal agencies, industrial enterprises and the European Union. In addition, the institute is commissioned by non-governmental organisations and environmental associations.

Oeko-Institut is a non-profit association. Financial resources come mainly from third-party, project-based funding. Contributions and donations made by the association's 2,500 members – including more than 30 local authorities – guarantee independence. The institute's annual turnover runs to some 12 million Euros.

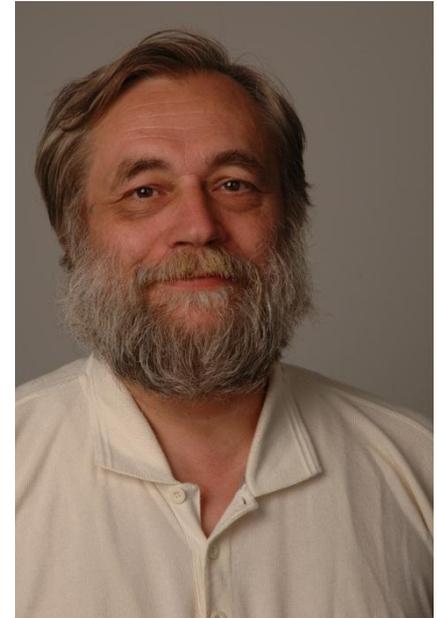
Who I am

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Nationality: German
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Profession: Senior Researcher at Öko-Institute
Qualification: Graduated Engineer in Chemical Technology
Experience: 23 years at the Institute
Mainly working in projects on behalf of Federal
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Numerous projects in the following fields:

- Nuclear Waste Management, including final disposal
- Nuclear Decommissioning
- Clean-up and restoration of contaminated sites
(Former uranium mining, waste storage sites, etc.)
- Chemotoxic/Hazardous Waste Studies
- Environmental Impact Studies and Assessments
(Nuclear and non-nuclear aspects)
- Radiation Protection and Facility Safety issues
- etc. etc.

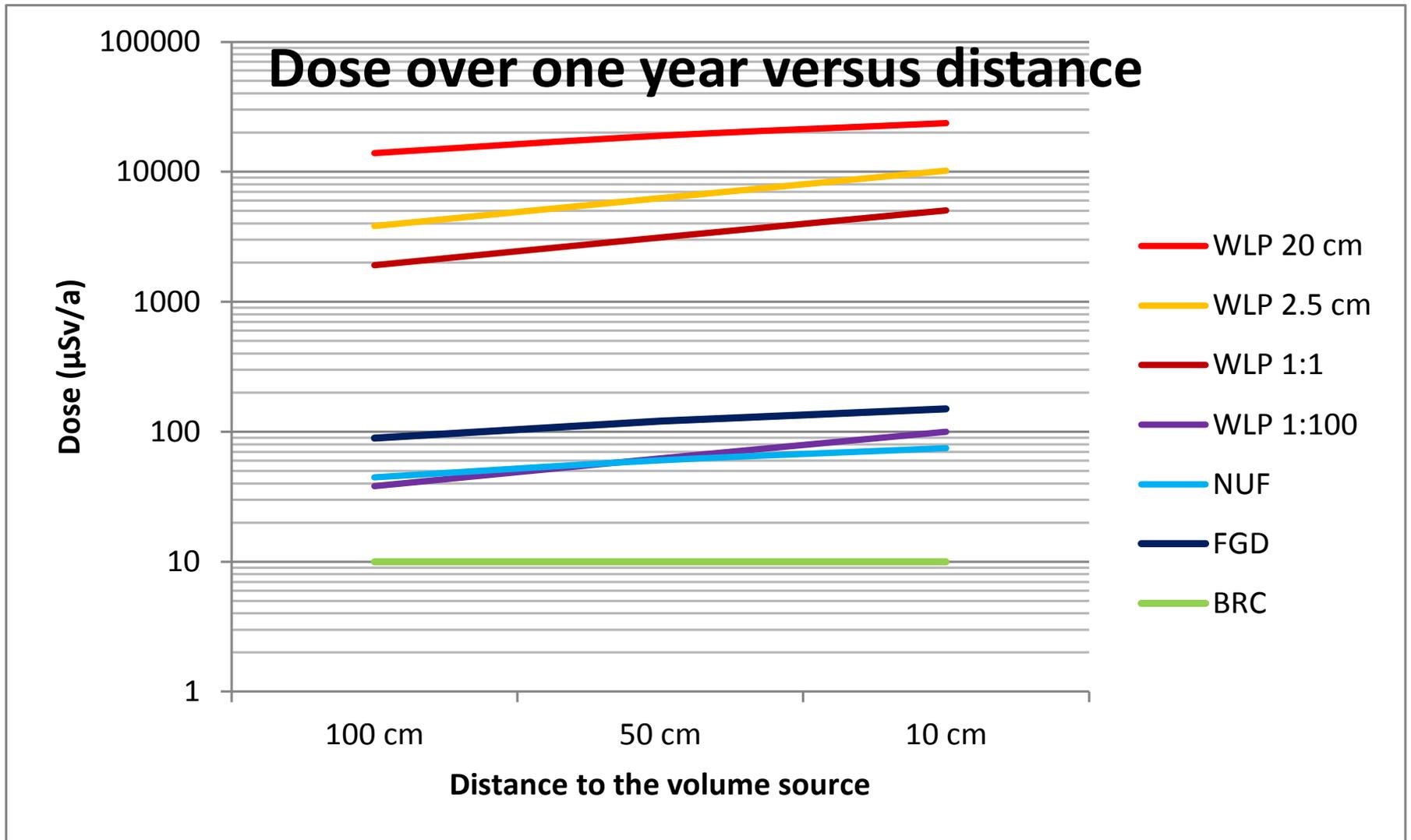
Complete reference list: [Ref Nuclear](#)



Main Results: Waste Management

- Release of Lynas's wastes from regulatory control and to the public domain has to **primarily** consider the adverse health consequences: if the radiological dose/risk of such release exceeds internationally accepted **protection levels** the waste cannot be released and has to be disposed of in any case.
- Our own dose calculation based on Lynas waste data shows:
 - The WLP waste with the highest radioactive content would exceed by a factor of more than 1,000 above internationally accepted protection levels for the release of radioactive materials from regulatory control (Beyond Regulatory Concern, BRC level).
 - Even if diluted 1:1 with gypsum the WLP waste is 200-fold above those internationally accepted levels!
 - Even if diluted 1:100 with gypsum (technically unrealistic) the doses would still exceed BRC level!
 - Even the less contaminated wastes FGD and NUF are above that level and require 1:4 & 1:9 mixing respectively before they can be released (assumed that the material properties meet the necessary requirements and their toxic by-product content is below any non-radiological environmental concern).

Results of the dose calculations



- Consequences:
 - The roughly 1.2 million tons of WLP waste to be produced have in any case to be disposed of in a Permanent Disposal Facility (PDF), that isolates the radiologic and toxic content over virtually unlimited future times.
 - Any hopes that this waste can be re-used in the public domain are scientifically and technically nonsense and, with respect to the so posed risks, careless.
 - The operation of a facility that generates those wastes should only be (temporarily or permanently) allowed if the PDF is available, otherwise another dangerous legacy is created and the burden of caring about and disposing these wastes is unacceptably shifted to future generations.
 - The fact that neither the International Atomic Energy Agency (IAEA, in it's review) nor Lynas (in its Radioactive Waste Management Plan RWMP) nor the regulators AELB and MOSTI recognize, mention and respect the dose criteria and do not set this as their prime condition for any re-use scenario is irresponsible.

- Interim storage of wastes on-site:
 - Residue Storage Facilities (RSF) constructed with only 1 mm HDPE layer and a single 30 cm clay layer
 - Would not be allowed in Germany, not even for the lowest toxic waste categories:
 - Minimum thickness 2.5 mm HDPE to ensure resistance against mechanical stress (9 m of waste on top!) and to proof and quality assure that the sheets are welded without voids/leakages
 - Minimum two separate clay layers of 25 cm each to ensure material and layer quality
 - Environmental consequences:
 - Leakage and seepage from the beginning of the storage period on will enter ground and groundwater under the RSFs
 - Contamination with unknown seepage water quality because no reliable leaching experiments were made/published/presented to allow for a thorough environmental evaluation
 - **The poor layout of the RSFs should not have been accepted by the regulating agency.**

- The RSF for WLP waste:
 - The emplacement of the WLP waste on top of the RSF requires a certain pre-drying period, otherwise the RSF surface gets slippery and emplacement machinery and workers are not able to access the surface.
 - In times of heavy rain and over the whole monsoon season, pre-drying and keeping the RSF surface dry enough doesn't work.
 - Lynas still has to find a solution for that problem.
 - This problem was neither identified in the planning phase nor during the process to achieve the construction permit.
 - Instead of a consequent and thorough planning now ad-hoc solutions have to be developed.
 - Any proposed solution should not increase worker's doses.

Emissions from the plant

- The filtering equipment used by Lynas to reduce gaseous emissions from its cracking stage is not sufficient.
- According to the current state of technology in Europe neither the removal of acidic gases nor of particulate matter from the off-gas of the plant would be acceptable.
- The wastewater of the plant has a high salt content, comparable to seawater. This content isn't even mentioned in the Environmental Impact study nor is it evaluated.
- The wastewater flows into a several km long open channel, easily accessible by men and animals.
- Neither the salt nor the rare earth content of the wastewater is limited and monitored.
- It is not understandable why these serious environmental issues were not detected when the Impact study was checked by the responsible agency.

More results

- The complete study (114 pages) can be downloaded here:
<http://www.oeko.de/oekodoc/1628/2013-001-en.pdf>
- The summary (5 pages) can be downloaded here:
<http://www.oeko.de/oekodoc/1629/2013-002-en.pdf>
- The press release (1.5 pages) can be downloaded here:
http://www.oeko.de/press/press_releases/dok/1484.php

Questions?

Thank you
for your
attention.

