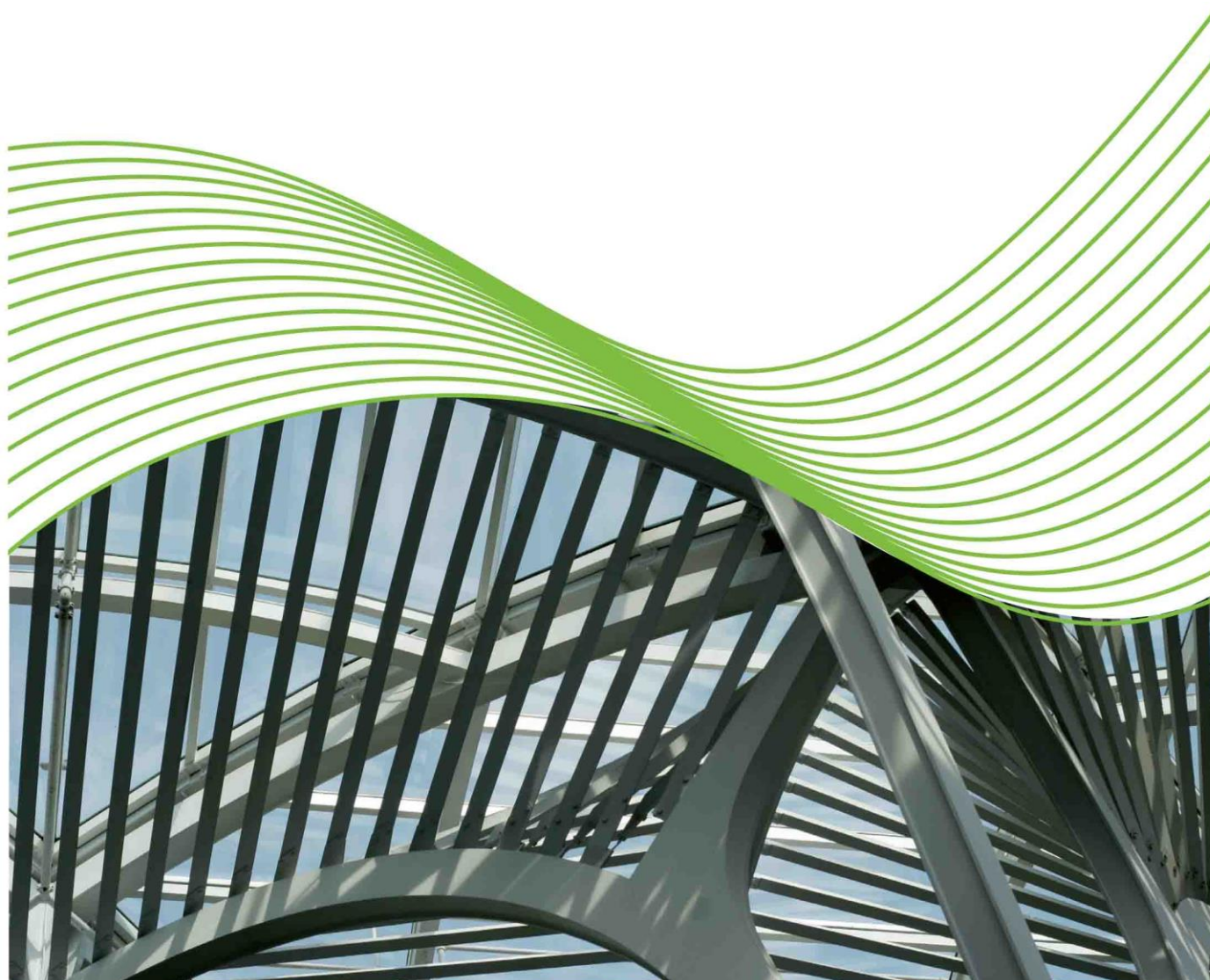




**PROPOSAL EXPOSURE SCENARIO BUILDING AND ENVIRONMENTAL
RELEASE ESTIMATION FOR THE WASTE LIFE STAGE IN SUPPORT OF FOUR
CLASSIFIED PRECIOUS METAL COMPOUNDS**



Ghent, 05 September 2014

Dear Dr Nicolay,

As a follow up of our telephone conference (26-08-2014) we are pleased to give you our proposal of the costs and the steps necessary for conducting the environmental release estimation of the waste life stage associated with the manufacture and use of four classified precious metal compounds. The four compounds are:

- Tetrachloroauric acid (CAS nr 16903-35-8)
- Potassium dicyanoargentate (CAS nr 506-61-6)
- Silver cyanide (CAS nr 506-64-9)
- Potassium dicyanoaurate (CAS nr 13967-50-5)

Each compound will have its own specific waste report tailored to its needs.

The current proposal is divided in three phases:

Phase 1: or scoping phase consists of the dissemination of a questionnaire to manufactures/importers and potentially also to representative downstream users to collect data on Hazardous Waste (HW) formed during the process. In addition an initial screening of the scientific literature for the relevant precious metal concentrations in Municipal Waste (MW) and the amounts of recycled waste (RW) will be executed. The collected information on the different waste streams is intended to identify the most relevant waste stages for which a quantitative assessment is warranted.

Phase 2: a quantitative exposure assessment of the identified relevant waste stages including a local exposure assessment for all relevant waste streams

Phase 3: Documentation of the waste information to the relevant sections of the CSA/CSR report and associated exposure scenarios

We sincerely hope that our services may find your interest, and look very much forward to a potential co-operation. In case of questions, please do not hesitate to contact us at the office address given below.

Yours sincerely,

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1. INTRODUCTION

Although in general REACH requirements for a substance in the waste life stage are limited the final guidance on exposure scenario building and environmental release estimation for the waste life stage released by ECHA in December 2010 and updated in 2012 is quite extensive.

Already, within the REACH framework M/I were obliged to:

- Provide general information in the Technical dossier on types, amounts and composition of waste occurring on manufacture and use of the substance,
- Take the waste life cycle stage into account when undertaking the appropriate exposure and risk assessments embedded in the exposure scenario for their identified uses.

With the new guidance more details have become available on how this assessment should be conducted. The workflows presented in the guidance document outlines two assessment approaches. A generic approach when the registrant is unable to obtain specific information on what happens during the waste life cycle stage and a specific approach that may be more suitable if the registrant has more access to more detailed information about the wastes generated on use or at the end-of-service life of articles. Note that waste from manufacturing should always be assessed based on the specific approach.

Figure 1 gives a overview of the workflow for the generic approach

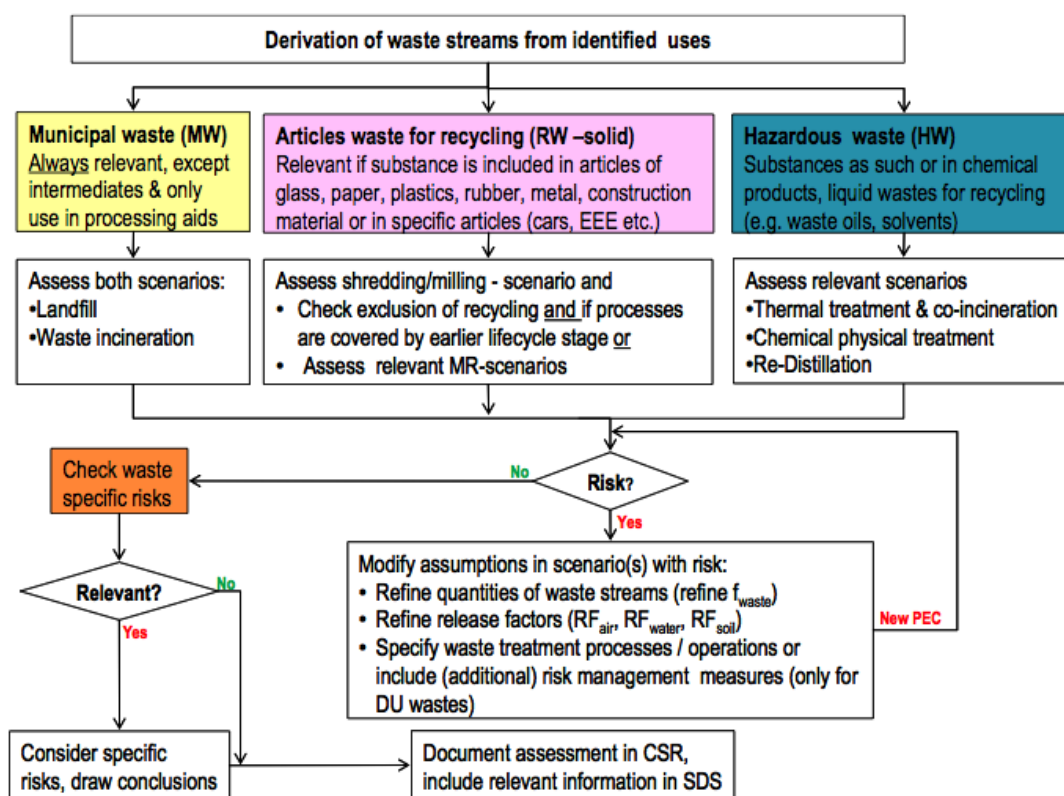


Figure 1: Workflow for generic approach

The approach suggests grouping of wastes into three waste streams (municipal waste, recycling waste and hazardous waste) in order to structure and simplify the assessment. Based on information on types and composition of wastes and uses generating these wastes, the M/I should estimate the amounts of the substance contained in wastes entering each stream. The assessment has to be performed differently for industrial setting uses and wide dispersive uses. Although the emphasis of the waste analysis is still on the presence of the substance in Municipal waste (MW) (should always be conducted) the relative importance of metals in recycling waste (RW) and hazardous waste (HW) should now also be assessed on a case-by-case basis. Waste remaining in the environment should not be assessed and is likely covered by the service life assessment.

2. PHASE 1: SCOPING EXERCISE: RELEVANCE OF THE WASTE STAGE AND DEFINITION OF THE ASSESSMENT TO BE CARRIED OUT

In this phase the conditions of waste treatment and the relative exposure arising from the waste stage of a substance following manufacture and all the identified uses (and subsequent service life) covered by the registration should be described. This preliminary material/substance flow analysis enables to establish the link among the sources of origin (example precious metal containing products) and the different waste fractions (MW, RW, HW) and enables to identify the most relevant waste stages for the manufacture and use of those precious metal compounds. The amount of information and level of detail available will determine the type of assessment suitable for the CSR (generic vs. specific). As indicated in section 1, MW, RW and HW will be the focal point of the assessment.

The scoping exercise will take into account different qualitative and some quantitative elements such as:

- Type of waste
- Fraction of precious metal compounds becoming waste for the identified uses
- Concentration in waste and categorization into MW/HW/RW
- Exposure conditions at the waste stage
- Dispersive use pattern of the articles containing those precious metal compounds
- Specification of suitable waste management measures or treatment techniques (internal and external waste management)

The information described above will be summarized in tables and communicated in a waste report for each precious metal compound separately.

It is assumed that only a very limited amount of measured data is available on the presence of precious metals in MW. Although the data are very limited they might be used as a first benchmark. If needed a further refinement by embarking to a monitoring program can be needed (costs not included in this proposal).

Information will for each of the classified precious metal compound have to be collected on the amounts of waste coming from manufacture and recycling (i.e. residues), their processing (e.g. used as feedstock for new production) and potential waste management measures in place (e.g. precious metal compound containing waste produced that cannot be recovered and is disposed of in landfills or incinerators).

Once a good understanding of the importance of the different waste stages is obtained the need to cover those in full detail should be examined. There is no need to carry out a detailed exposure assessment for the waste stage in case the described conditions in the waste stage are already covered in the exposure assessment for other life cycle stages (e.g. could be the case for the metals recycling sector) or if it can be concluded that expected releases to the environment from the waste stage are significantly lower than those from the previous life stages. Most likely, for metals in general no further detailed exposure assessment will be needed for the recycling waste life stage as this is most of the time already covered by the manufacturing stage.

Besides the consultation of the grey literature, peer reviewed literature and waste statistics a questionnaire will be used to collect in-house waste data available from the manufacturers side and main downstream users, for the identified uses. This information will be evaluated and used to justify any decisions taken with regard to omitting or including a specific waste life stage in the CSA. The output of this initial analysis will be:

- Types of chemical products and articles that may become waste during the life cycle of the four precious metal compounds under scrutiny.
- Identification of residues from applied environmental risk management measures
- Identification of relevant waste streams for which more detailed exposure assessment is warranted (phase 2)
- Identification of the waste codes used in the industry

The anticipated effort and costs involved per substance for the performance of the scoping study are:

1. Conduct, documentation of a screening literature search, scientific staff (approx.):	0.5 days à EUR 1024.00/day
2. Direct costs, on-line access to literature data bases, proposed budget (approx.)	EUR 600.00
3. Sending, collecting and processing questionnaire	2 days à EUR 1,024.00/day
4. Evaluation and qualitative/quantitative assessment	1 days à EUR 1,024.00/day
5. Reporting and justification inclusion or exclusion relevant waste stages:	0,5 days à EUR 1,024.00/day

In conclusion, a budget for this initial scoping phase per substance is EUR 4,696.00. This results in a total budget for all four precious metal compounds of **EUR 18,784.00 euro**.

The scoping study will take approximately 1 month.

3. PHASE 2: QUANTITATIVE EXPOSURE ASSESSMENT FOR THE WASTE LIFE STAGE AND RISK CHARACTERISATION

Based on the outcome of the scoping exercise a more qualitatively or quantitative exposure assessment will have to be performed for those waste life cycle stages deemed relevant. This work entails the following steps:

1. Development approach to exposure assessment tier 1
2. Exposure scenario building and release estimates
3. Exposure assessment calculations and risk characterisation

3.1 Development approach to exposure assessment tier 1:

Once the relevant waste stages have been identified the type of assessment suitable for the CSR and the related recommendations/assumptions to be communicated in the exposure scenario should be determined. Releases of the waste stage should be evaluated both on a local and a regional scale. Furthermore based on the amount of available information on uses, wastes and waste treatments the decision can be made either to perform a generic assessment or a specific assessment. In the generic assessment typically default parameters will be used which are conservative of nature to balance the lack of data. A specific approach could be needed to avoid overly conservative values if safe use cannot be demonstrated.

3.2 Exposure scenario building/release estimates/exposure calculations and risk characterisation:

For most metals the substance is not eliminated (destruction or immobilisation) during the waste treatment process and most often a release estimation and quantitative risk characterisation will be necessary to support the conclusions on waste process and conditions for safe handling of waste. Incineration of MW will result in precious metals distributed to slag/bottom ash and fly ash. Slag and ashes are either disposed of in landfills (covered by the assessment of the landfill scenario) or reused in road construction. According to the guidance release estimates will also have to be estimated for the two other possible relevant waste streams: recycled waste (RW) and hazardous waste (HW). Depending on the information available the metal default values as provided in the guidance will have to be used or a refined approach should be worked out. Most probably for recycling of precious metals this assessment is of no relevance for the CSA since the recycling of precious metals is probably already covered by the existing exposure scenarios.

A budget of 4 man-days à EUR 1,024.00/day is foreseen per substance for phase 2 = EUR 4,096.00 euro This results in a total budget for all four precious metal compound of **EUR 16,384.00 EUR**

4. PHASE 3: DOCUMENTATION AND COMMUNICATION

Finally the results of the waste assessment should be documented in the chemical safety report (CSR) and Exposure Scenarios (ES). This should cover the identification of waste streams resulting from manufacture and the identified uses, describing the condition of internal and external waste management in the relevant exposure scenarios, release estimates and the characterisation of related risks. No separate exposure scenarios for the waste life stage are needed since waste is not regarded as “ a use” under REACH. The waste information needs to be added to the exposure scenarios described in section 9 of the CSR.

A workload of 4 man-days a ratio of EUR 1024.00/day is estimated per substance. This results in a total budget for all four precious metal compound of **4,096.00 EUR** for this phase.

5. OVERALL BUDGET AND TIMING

Major milestones that are foreseen are:

- Distribution of questionnaire to members: September/October 2014
- Scoping study: January 2015
- Quantitative Exposure Assessment: February 2015
- Documentation in CSR/GES : March 2015

An overall budget of EUR 39,264 (excl VAT) is estimated to finalize phase 1, 2 and 3 and deliver a specific waste report for each of the four classified precious metal compounds.

Action	Budget [EUR]
	Total (EURO)
<u>Phase 1</u> : scoping exercise	18,784
<u>Phase 2</u> : quantitative exposure assessment	16,384
<u>Phase 3</u> : documentation and communication	4,096
Total	39,264 (excl VAT)

6. RELEVANT EXPERIENCE – ARCHE

Relevant experience of ARCHE to help you fulfilling this REACH requirement

Since 1996 ARCHE has build up an in depth expertise on the assessment of the emissions associated with the presence of metals in the municipal waste stream. ARCHE developed the initial methodology to assess emissions from Municipal Solid Waste (MSW) in the framework of the targeted risk assessment of Cd in Ni-Cd batteries. The latter approach was discussed in depth and the methodology agreed by the Member States at the technical meeting level. Since then ARCHE already adapted some of the metal waste reports to the EU-27 situation (reference year 2009) and also looked at metal waste flows such as the contribution of spent batteries to the metal flows of Municipal Solid Waste (RECHARGE, 2005).

Within the framework of REACH ARCHE has been involved in the generation of waste reports for Ag, Cd, Co, Mo, Pb, Ni, Sb, V and Zn.