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ARBEITSBERICHT NAB 23-28

Chemical Criteria for Waste Group Classification: a Model Approach

April 2023

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KEYWORDS
Waste group classification, dose calculations, organics, pH, complexing ligands

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Nagra Arbeitsberichte ("Working Reports") present the results of work in progress that have not necessarily been subject to a comprehensive review. They are intended to provide rapid dissemination of current information..

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List of Acronyms

AGTs	Waste package Type
ATA	Alpha Toxic Waste
C-S-H	Cement phase: Calcium-Silicate-Hydrate
EDTA	EthyleneDiamineTetraacetic Acid
GLU	Gluconic acid
ISA	Isosaccharinic Acid
L/ILW	Low- and Intermediate-Level Waste
MIRAM	Modellhaftes Inventar der Radioaktiven Materialien
NAB	Nagra Arbeitsbericht
NTA	Nitrilotriacetic acid
NTB	Nagra Technical Report
RBG	Nagra's general licence application (Rahmenbewillingungsgesuch in German)
SGT	Sectoral plan for deep geological repositories
WG1	Waste Group 1
WG2	Waste Group 2

1 Introduction

The purpose of this report is to develop and substantiate the criteria allowing the classification of waste groups for low- and intermediate-level waste (L/ILW). The criteria are primarily based on the chemical properties of the waste and their potential consequences. The emerging waste groups are relevant for:

- the consequence analyses supporting the safety case for the general licence application (RBG) (Nagra 2024a)
- the assessment of gas-related impacts (Nagra 2024b)

The report focuses on the following geochemical aspects of the cementitious near-field:

- classification of waste package types (AGTs) into waste groups
- model-based determination of a local pH value within AGTs. The local pH serves as the basis for assignment of corrosion rates to metallic materials contributing to gas production.
- calculation of the concentrations of complexing ligands in the near-field pore water. These concentrations serve as the basis for an assessment of the impact of complexing ligands on radionuclides sorption.

The methodology followed in this report is based on a so-called mixing tank approach with a homogenised fully saturated near-field as done for the abstraction of the dose calculations (Nagra 2024a). It is to be noted that partially saturated conditions within the L/ILW near-field dominate the time of the period of consideration as shown by Papafotiou et al. (2016) and explained in Martin et al. (2023). However, as thermodynamic calculations can only be performed for fully saturated conditions and as these conditions are a conservative abstraction of the repository, a full mixing tank assumption is considered for the waste group classification, which is a conservative scenario.

Compared to the 2014 version of the same report for SGT Stage 2 (Cloet et al. 2014), all assumptions about the composition of the L/ILW refer to the MIRAM ("**M**odel **I**nventory of **Ra**dioactive **M**aterials") RBG database (Nagra 2023a) instead of MIRAM 14 (Nagra 2014a). Furthermore, the data are presented as a function of AGT, instead of waste sorts. AGT's are representing the composition of each individual waste type whereas in the waste sorts, similar AGT's have been merged. The previous classification in terms of waste sorts is no longer used for RBG.

The degradation rates for organic materials are reported in Guillemot et al. (2023b), the definition of the source term and release rates of ^{14}C containing waste types are documented in Nagra (2023b), and the assignment of the corrosion rates to metallic materials based on the pH values calculated here are reported in (Nagra 2023c). Therefore, these data will not be presented in the scope of this report anymore in comparison to the previous study by Cloet et al. (2014).

2 Classification into waste groups

L/ILW is stored in concrete vaults together with cement-based disposal containers and cement-based container infill. The L/ILW caverns are backfilled with cementitious material. Due to the chemical conditions in the near-field, many radionuclides are retained by sorption on cement minerals and by the low solubilities in the corresponding high pH environment. The cement sorption data are provided in Tits & Wieland (2023) and the solubility limits of dose relevant nuclides in a cement pore water in Hummel et al. (2022).

Degradation of the cement by carbonation as a result of the amount of CO_2 generated by the degradation of organic material may alter the cement mineralogy. Further, the presence of microsilica in some cement formulation may further degrade the cement by means of the pozzolanic reaction. This alteration of the cement mineralogy may result in a reduction of the sorption capacity within the cement.

Furthermore, some AGTs contain substances (i.e. complexing ligands) that can increase the mobility of radionuclides by complexation. This may also result in a sorption reduction of radionuclides by the cement. The most important substances with regard to their concentration in the pore water of the near-field and their complex-forming properties are:

- Isosaccharinic acid (ISA)
- Gluconic acid (GLU)
- Ethylendiamintetraacetic acid (EDTA)
- Nitrilotriacetic acid (NTA)
- Cyanide
- Nitrate/Nitrite

To take into account the possibility of increased mobility of radionuclides and/or the possible unfavourable retention of the radionuclides caused by these substances in the case of increased cement degradation which impairs sorption, AGTs are to be classified into two groups, as implemented previously by Cloet et al. (2014) in model calculations.

Waste group 1 (WG1) refers to AGTs that do not contain these substances above in relevant concentrations and where the cement is not significantly impaired by the cement degradation. This means that the radionuclide retention properties of the cement within the waste package types are intact. For waste group 2 (WG2), these substances are present in significant concentrations in the AGTs and/or the sorption capacity of the cement is impaired due to increased hardened cement paste degradation as a result of the cement degradation processes.

The processes influencing cement degradation are described in Section 2.1 and 2.2. The approach for the determination of the extent of the cement degradation is presented in Section 2.3 and the evaluation of the impact of complexing agents is provided in Section 2.4. A summary of the relevant indicators is given in Chapter 3.

For the waste group classification, each AGT from the MIRAM-RBG database (Nagra 2023a) is evaluated individually. Both, the available cement paste and the corresponding pore water volume within each AGT can be calculated. The waste group classification entails the comparison between the calculated values and the criteria.

The resulting classification of AGTs into the WG1 and WG2 is documented in Appendix A.

2.1 Local cement degradation due to decomposition of organics

2.1.1 Degradation of organic materials

In Nagra's concept, organic materials are expected to degrade into CO_2 and CH_4 by a combination of abiotic (mainly hydrolysis) and biotic processes (Guillemot et al. 2023, Kosakowski et al. 2023). Of relevance for the degradation of the cementitious near-field is the interaction between CO_2 and portlandite/calcium-silicate-hydrate (C-S-H) phases. A simplified, generic representation of the degradation of organic compounds, neglecting all kinetic aspects of this reaction, assumes the formation of CO_2 and CH_4 and can be described by:

$$2\{CH_2O\} \rightarrow CO_{2(g)} + CH_{4(g)} \quad (1)$$

The generic equation shows that the total amount of CO_2 and CH_4 produced depends on the carbon content of an individual organic compound, while the exact ratio of CO_2 and CH_4 produced depends on the average oxidation state of carbon in this compound (C(II) in reaction (1) results in equimolar quantities of CO_2 and CH_4).

2.1.2 Calculation of the amount of CO_2 generated by the formula method

It is assumed that organics decompose instantaneously and form CO_2 and CH_4 – gas. The partitioning in CO_2 and CH_4 – gas is being calculated using equation 2 (see below). This is a conservative assumption because the maximum amount of CO_2 produced is considered for cement degradation.

The calculation of the amount of CO_2 formed is based on considering the average oxidation state of carbon in the organic compound, which disproportionates into +4 (CO_2) and -4 (CH_4) oxidation states. The explicit decomposition reaction is therefore not required. It should be noted that the formation of CH_4 is not relevant for the degradation of cementitious materials and thus not further considered.

Formed CO_2 [mol] can be estimated as follows (eq. 2):

$$CO_2 = f\,\frac{(4+z)}{8M_C}\,m \quad (2)$$

m: Mass of the organic compound [g]

f: Mass fraction of carbon (C) in the mass of the organic compound

z: Average oxidation state of C in the organic compound

M_C: Molar mass of carbon [12.01 g/mol]

For example, the decomposition of 1 kg polycarboxylate yields 15.9 mol CO_2.

($C_3H_3O_2Na$, M = 94.04 g/mol, z = 0, m = 1'000 g, f = (3 × 12.01 g/mol)/94.04 g/mol = 0.38)

$$CO_2 = 0.38\,\frac{(4+0)}{8 * 12.01\ g/mol}\,1'000g = 15.9\ mol \quad (3)$$

2.1.3 Degradation of the cement by carbonation

The CO_2 generated by the degradation of organics will react with calcium-containing cement minerals, especially with portlandite and C-S-H phases in hardened cement paste, thus leading to the formation of carbonates (see reaction 4 for the reaction of portlandite with CO_2).

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O \tag{4}$$

This leads in a first stage to the decomposition of portlandite (after the plateau in Fig. 2-1 at pH ~ 12.5) followed by the carbonation of C-S-H where its Ca/Si-ratio decreases from ~ 1.7 to 0.65. If a sufficient amount of CO_2 is interacting with the cement paste, the resulting pH of the cement pore solution is shifted towards neutral pH conditions.

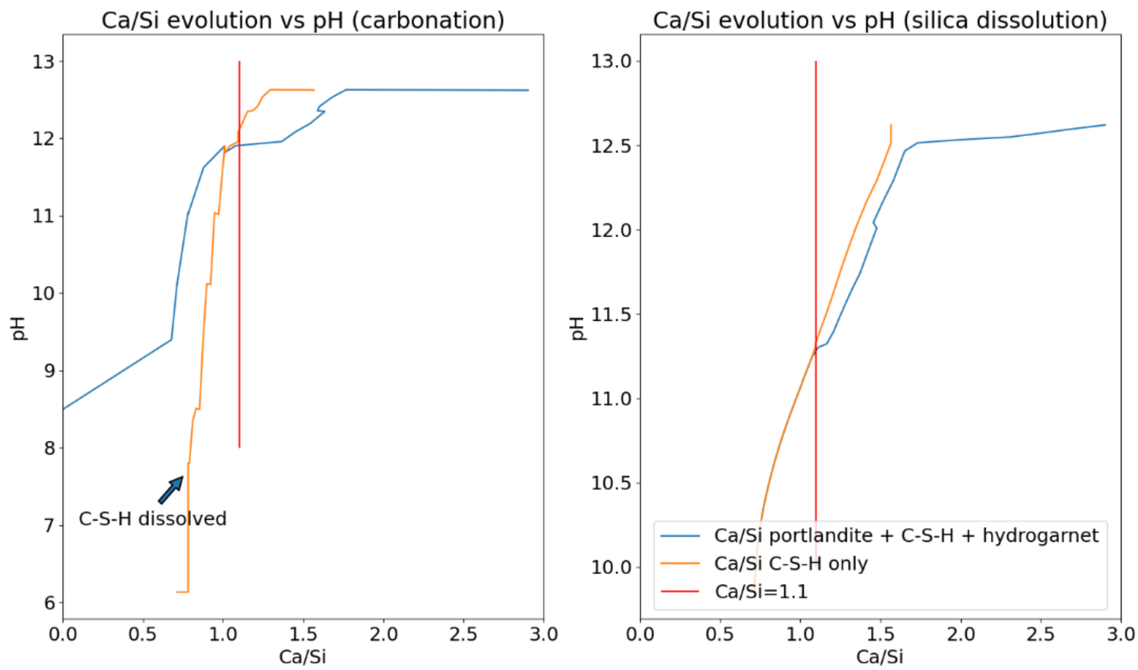

Fig. 2-1: Change of pH as a function of the degradation of the cement by a) effect of CO_2 addition to the cement degradation, b) effect of silica addition on the cement degradation

The cement paste refers to the one presented in Kosakowski et al. (2023) appendix A (see below). The evolution of the molar Ca/Si-ratio of the cement paste and the Ca/Si-ratio of C-S-H in equilibrium with the cement paste is shown.

As the loss of cementitious minerals in the near-field by carbonation depends on the waste composition within the AGT, the "portlandite criterion" was previously used as a criterion for waste group classification (see Cloet et al. 2014). The "portlandite criterion" foresaw the preservation of 2/3 of portlandite based on mass balance with the produced CO_2. When the CO_2 generated from the organic materials present in a AGT consumed more than 2/3 of the available portlandite, this waste sort was assigned to WG2 in the scope of the previous studies by Schwyn (2008) and Cloet et al. (2014). However, the pozzolanic reaction also has an impact on the Ca-inventory of portlandite and C-S-H as will be discussed in Section 2.2, and therefore, the 2/3 portlandite criteria could no longer be maintained.

2.2 Local cement degradation by the pozzolanic reaction

A detailed evaluation of the waste inventory and the composition of the cements documented in the MIRAM-RBG database (Nagra 2023a) has shown that certain AGTs contain fine-grained silicon dioxide (SiO_2), called silica-fume or microsilica (e.g. Micropoz). These are pozzolanic materials that interact with portlandite upon hydration leading to its decomposition. The pozzolanic reaction can be written in a simplified manner according to reaction 5:

$$Ca(OH)_2 + SiO_2 + 2\ H_2O \rightarrow \text{C-S-H} \tag{5}$$

Further, the interaction of SiO_2 with C-S-H phases results in the uptake of Si-ions, which results in a decrease of the Ca/Si-ratio of C-S-H (see Fig. 2-1 right). Therefore, the presence of microcrystalline SiO_2 is important with respect to its impact on C-S-H, which is responsible for the sorption of radionuclides and the pH of the cement pore water.

As the pozzolanic reaction with micro silica is considerably faster than the production of CO_2 by the degradation of organics (from 10^{-3} a^{-1} to 10^{-5} a^{-1}, see Guillemot et al. 2023) and the interaction of CO_2 with the cement, the pozzolanic reaction might have already consumed (all or some) portlandite of the cement paste within the AGTs before the carbonation process starts. Therefore, a new criterion has been introduced based on the Ca/Si-ratio of the cement paste (see Section 2.3).

2.3 The Ca/Si-ratio of the hardened cement paste: An indicator for its sorption behaviour and the evolution of the pH

2.3.1 Sorption behaviour of the hardened cement paste dominated by C-S-H

The main minerals within the cement paste are portlandite, C-S-H phases and hydrogarnet. Cement degradation occurs over three stages as summarised in Kosakowski et al. (2023). With respect to the sorption of radionuclides, C-S-H phases are the main sorbing phases within the cement paste (Tits & Wieland 2023).

It is considered that C-S-H with a higher Ca/Si-ratio have a higher anion sorption capacity in comparison to C-S-H with a Ca/Si ratio < 1.1, which is related to a change in the C-S-H structure that leads to a lower sorption capacity for anions. The reason is that C-S-H phases with low Ca/Si-ratio have a negatively charged surface due to the presence of negatively charged silanol groups, which greatly reduces anion sorption. With increasing Ca/Si-ratio, Ca^{2+} ions sorb on these negatively charged silanol group, resulting in a charge reversal of the C-S-H surface that favours anion sorption (see section B.8 in Tits & Wieland 2023).

It should be noted that anions are the main dose-determining radionuclides released from an L/ILW repository, while the retention of cationic radionuclides is much less sensitive to changes in pH and the Ca/Si-ratio of C-S-H phases. Therefore, as a criterion for the sorption has been introduced based on the theoretically calculated Ca/Si-ratio of the cement paste, mainly represented by C-S-H. To have a positively charged surface of C-S-H which is favourable for anion sorption, the Ca/Si-ratio of C-S-H in equilibrium with the cement paste should by ≥ 1.1.

In Fig. 2-2, the evolution of the Ca/Si-ratio of the cement paste as provided in Kosakowski et al. (2023 appendix A) as well as the Ca/Si-ratio of C-S-H in equilibrium with the cement paste is given. As shown in Fig. 2-2, the Ca/Si-ratio of the cement paste matches with the one of C-S-H at a Ca/Si-ratio of 1.1.

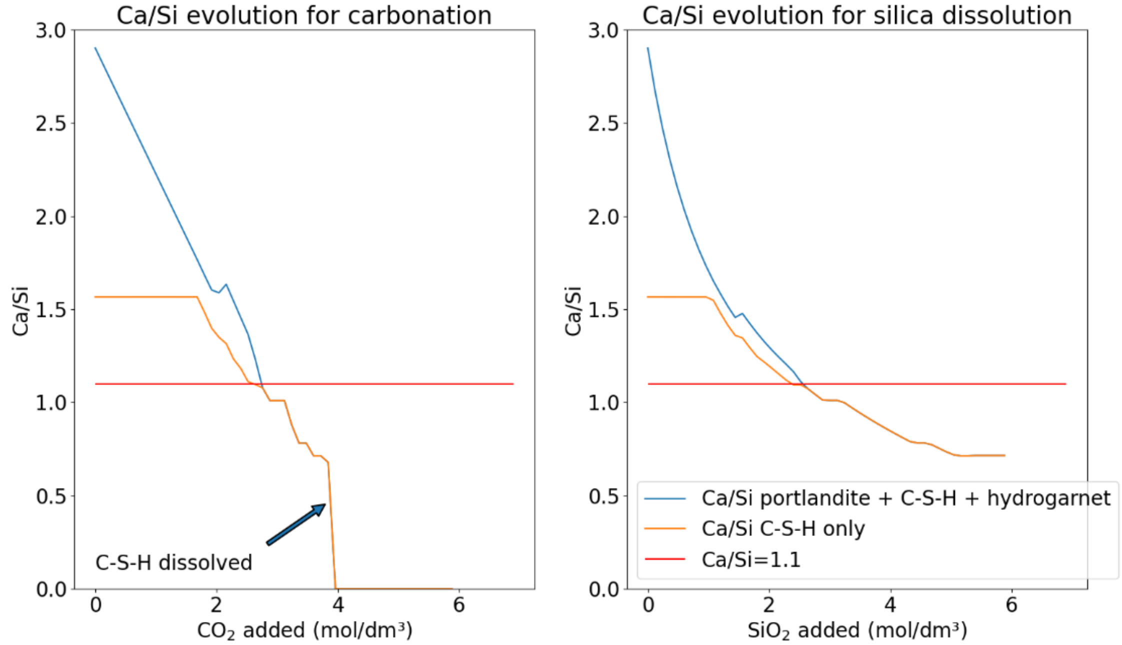

Fig. 2-2: Change of the Ca/Si-ratio as a function of the degradation of the cement by a) effect of CO_2 addition to the cement degradation, b) effect of silica addition on the cement degradation

The cement paste refers to the one presented in Kosakowski et al. (2023) in appendix A (see below). The evolution of the molar Ca/Si-ratio of the cement paste and the Ca/Si-ratio of C-S-H in equilibrium with the cement paste is shown.

In Fig. 2-3, the combined impact of carbonation and the pozzolanic reaction has been calculated for the cement paste presented in Kosakowski et al. (2023) and is plotted as pH versus the Ca/Si-ratio of the cement paste. Further, the Ca/Si-ratio of C-S-H is calculated for the cement which has been affected by the pozzolanic reaction only (from Fig. 2-1 b and 2-2 b). As shown, at a Ca/Si-ratio of 1.1 of the cement paste, C-S-H has well a Ca/Si-ratio of 1.1.

Therefore, it has been defined in the scope of this study that if the Ca/Si-ratio of the cement paste is ≥ 1.1, AGTs are allocated to WG1 and if the Ca/Si-ratio of the cement paste is < 1.1, to WG2 (see blue line in Fig. 2-2 and Tab. 2-1).

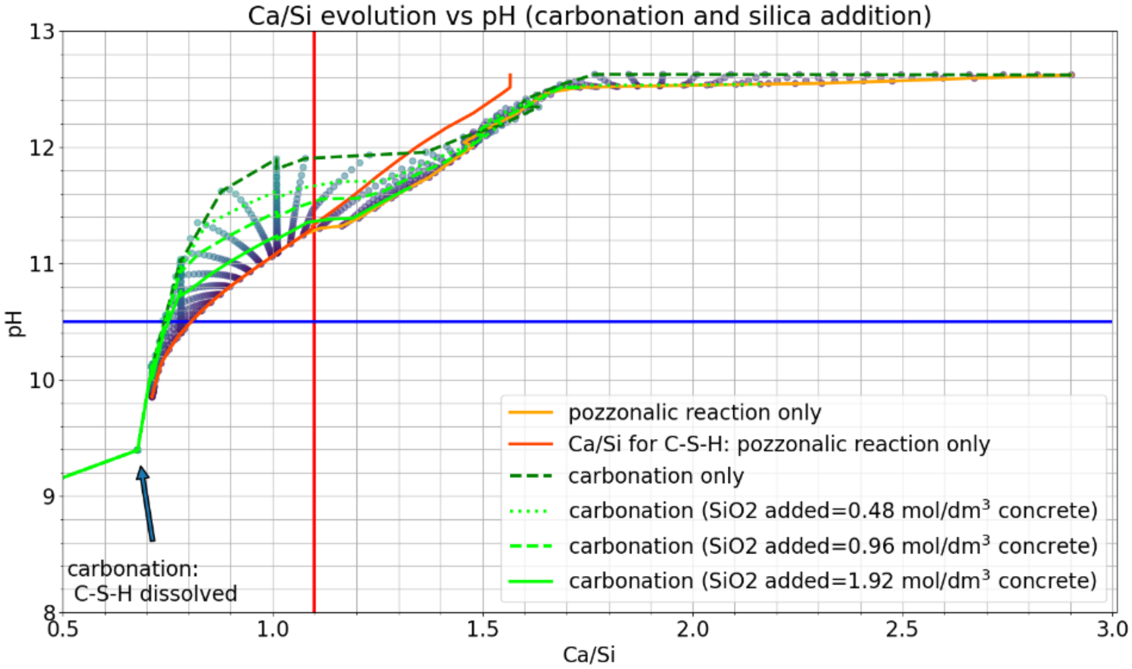

Fig. 2-3: Change of pH as a function of the degradation of the cement paste by the combined effects of carbonation and pozzolanic reaction

For comparison, the Ca/Si-ratio of C-S-H is plotted. The blue line indicates the Ca/Si-ratio of 1.1, which is used as a criterion for sorption; the red line corresponds to the pH of 10.5, which corresponds to a Ca/Si-ratio ranging from 0.75 to 0.83.

2.3.2 Impact of corrosion rates based on the Ca/Si-ratio of the cement paste

Degradation of the hardened cement paste by carbonation and the pozzolanic reaction alters the cement mineralogy and also its pH buffering capacity. As indicated in Fig. 2-1 and Fig. 2-2, addition of CO_2 (left figure simulating the carbonation process) or SiO_2 (right figure simulating the pozzolanic reaction) to the cement paste decomposes in a first stage the portlandite, which buffers the pH of the cement pore solution at pH ≈ 12.5 (see plateau in figures). Afterwards, congruent dissolution of the C-S-H phases occurs.

In the gas synthesis report (Nagra 2024b), corrosion rates will be assigned to metallic materials according to the local pH conditions of the cement-based near-field. According to the findings summarised in Diomidis et al. (2023), metal corrosion is usually accelerated at pH < 10.5. Fig. 2-3 shows the combined influence of the addition of CO_2 (carbonation process) and the addition of SiO_2 (pozzolanic reaction) on the pH and the Ca/Si-ratio of the cement paste. The Ca/Si-ratios extracted for values at pH ≈ 10.5 range from 0.83 to 0.74, which is mainly dependent on the amount of SiO_2 added to the system. The average value is 0.79 ± 0.025. Therefore, taking into account the numerical uncertainty, the criterion is introduced here that for the cement paste with a Ca/Si-ratio < 0.8, increased metal corrosion rates are to be applied for the gas generation calculations.

It is to be noted that this criterion is not for the assignment of AGTs to WG1 and WG2 but is explicitly a criterion for the assignment of corrosion rates. However, the mathematical approach to calculate the Ca/Si-ratio of the cement paste is the same but different Ca/Si-ratios of the cement paste are used as criteria (see Tab. 2-1).

Tab. 2-1: Ca/Si-ratio of the cement paste for waste group classification and assignment of corrosion rates

Waste group classification or corrosion criteria	Sorption criterion: Ca/Si-ratio of cement paste	pH-criterion
Waste group 1	≥ 1.1	Not relevant (pH > 11.3)
Waste group 2	< 1.1	Not relevant (pH < 11.3)
Low corrosion rates	≥ 0.8	≥ 10.5
High corrosion rates	< 0.8	< 10.5

2.3.3 Calculation of the theoretical Ca/Si-ratio of the hardened cement paste

The theoretical Ca/Si ratio of the hardened cement paste corresponds to the molar ratio of the total Ca and the total Si in the hardened cement paste and is determined by the total amount of the main Ca-containing and Si-containing cement phases, taking into account the stoichiometry of Ca and Si in these cement phases. To calculate the Ca/Si-ratio for (i) waste group assignment or (ii) selection of corrosion rates to be applied, the initial amount of cementitious minerals within the AGTs, container infill and container must thus be defined in a first step. To quantify the type and amount of cement phases, a simple mass balance calculation can be applied. The input data for these calculations (materials and quantities) are extracted from the MIRAM-RBG database (Nagra 2023a).

The following assumptions have been made:

1. The considered amount of cement paste results from (i) the composition of the AGTs as documented in the MIRAM-RBG database, (ii) the assigned cement proportion from the disposal container as well as (iii) from the assigned proportion of the container infill per AGT[1]. All these data are implemented in the MIRAM-RBG database.

2. The different cement formulations used are not distinguished from each other and are considered in a corresponding simplified way: A generic concrete formulation, assumed to be representative according to the current stage of the project for the generic L/ILW near-field is presented in Kosakowski et al. (2023, Appendix 1). The concrete formulation consists of a 400 kg CEM 1 52R, 180 kg $CaCO_3$-filler, 1'603 kg siliceous aggregates and 371.2 kg water (Tab. A-1 & Tab. A-3 in Kosakowski et al. 2023).

3. The amount of hardened cement paste (hydrated cement or cement stone) is obtained by summing the five standard materials listed in the MIRAM-RBG database for each AGT:
   - concrete
   - cement stone
   - ::cement stone-::HTS

[1] Note that in Cloet et al. (2014) only the cement within the primary waste package has been considered. However, in reality, the surrounding container infill mortar as well as the concrete container contribute to the chemical integrity and environment of the primary waste package (passivation of the steel of the waste package container) and the local pH conditions within a disposal container.

- ::cement stone -::OPC
- ::cement stone -::Sulfazem

The "::xx-::HTS/OPC/Sulfazem" standard materials consist of non-hydrated cement whereas concrete and cement stone (i.e. hardened cement paste) are the hydrated cementitious materials. The cement (CEM I 52.5 R) modelled by Kosakowski et al. (2023) with 20% porosity is used for the representation of the hardened cement paste in the near-field (see Tab. A4 in Kosakowski et al. 2023). The weight of the hydrated cement is 35.06% higher than the weight of the non-hydrated cement (1'000 g of non-hydrated cement gives 1'350.6 g of hydrated cement). The amount of hydrated cement in the concrete is calculated to be 21.15%.

It follows that the total amount of hardened cement paste (hydrated cement) from the five standard materials in the MIRAM-RBG database can be estimated with the following equation:

$$\text{amount of hardened cement paste} = \text{amount of concrete} * 0.2115 + [(\Sigma\text{::cement stone-::xx}) * 1.3506] + \text{cement stone} \quad (6)$$

4. The composition of hydrated cement for cement degradation stage 2 is given in Tab. A-8 in Kosakowski et al. (2023). C-S-H phases from the CSH-Q-models were discretised into several subphases according to the sublattice models defined in Kulik (2011). The hardened cement paste comprises of the following main phases (Tab. 2-2), which are considered for the following calculation of the Ca/Si ratio of hardened cement paste):

Tab. 2-2: Composition of the hardened cement paste

Data from Kosakowski et al. 2023, Appendix 1.

Cement phase	**Formula**	**mmol/kg cement paste**
Portlandite	$Ca(OH)_2$	3'135.82
CSHQ-JenD	$(CaO)_{1.5}(SiO_2)_{0.6667}(H_2O)_{2.5}$	1'112.83
CSHQ-JenH	$(CaO)_{1.3333}(SiO_2)_1(H_2O)_{2.1667}$	790.86
CSHQ-TobD	$((CaO)_{1.25}(SiO_2)_1(H_2O)_{2.75})_{0.6667}$	903.15
CSHQ-TobH	$(CaO)_{0.6667}(SiO_2)_1(H_2O)_{1.5}$	42.23
Hydrogarnet	$(Al_2O_3)[(CaO)_3(SiO_2)_{0.84}(H_2O)_{4.32}]$	54.37
Hydrogarnet	$(AlFeO_3)[(CaO)_3(SiO_2)_{0.84}(H_2O)_{4.32}]$	216.36
Hydrogarnet	$(Fe_2O_3)[(CaO)_3(SiO_2)_{0.84}(H_2O)_{4.32}]$	42.65

The models predicts that ettringite is not stable when 1.5 mol SiO_2 is added at pH 11.5 to 12.5, so ettringite is not included in the calculation. In addition, hydrotalcite and AFm phases have been neglected as both are minor phases. Therefore, calculating the Ca/Si ratio based on the presence of the main cement phases is a conservative approach.

5. Carbonation has an effect on the Ca-bearing phases of the hardened cement paste. The calcium-content of the hardened cement paste can be expressed in terms of portlandite equivalents, i.e. how many moles of $Ca(OH)_2$ are present in the corresponding phases. For instance, in the case of CSH-JenD, 1.5 moles of $Ca(OH)_2$ are present in the cement phase. The calculated portlandite equivalents per kg hardened cement paste are shown in Tab. 2-3.

Tab. 2-3: Composition of the cement paste and calculated portlandite- and SiO_2-equivalents

Cement phase	mmol/kg cement paste	Stoichio-metric factor for $Ca(OH)_2$	Portlandite-equivalent: $Ca(OH)_2$ mmol pro kg cement paste	Stoichio-metric factor for SiO_2	SiO_2-equivalent: mmol pro kg cement paste
Portlandite	3'135.82	1	3'135.82	-	-
CSHQ-JenD	1'112.83	1.5	1'669.25	0.6667	741.89
CSHQ-JenH	790.86	1.333	1'054.45	1	790.86
CSHQ-TobD	903.15	1.25	1'128.94	1	903.15
CSHQ-TobH	42.23	0.6667	28.17	1	42.23
Hydrogarnet (Si-Hg)	54.37	3	163.11	0.84	45.67
Hydrogarnet (Si-Hg)	216.36	3	649.09	0.84	181.74
Hydrogarnet (Si-Hg)	42.65	3	127.95	0.84	35.83
Total			**7'956.77**		**2'741.37**

6. The amount of SiO_2 present in the C-S-H will be affected by the pozzolanic reaction with SiO_2. Therefore, the Si-equivalents based on the stoichiometry of the C-S-H and hydrogarnet present within the cement paste has been calculated and is also given in Tab. 2-3.

7. The amount of CO_2 generated from the organic materials within the waste is calculated by the formula method (see Section 2.1.2), assuming an instantaneous decomposition of the organic materials. The amount of CO_2 generated is substracted from the portlandite equivalents (see numerator in eq. 7).

8. If AGTs contain microsilica (silica fume, microsilica or Micropoz; sampled from the MIRAM-RBG data base), this material is to be added to the SiO_2-equivalents in the denominator in eq. 7. The reason is that by means of the pozzolanic reaction (eq. 5) portlandite is getting consumed but new C-S-H is generated. Therefore, the addition of SiO_2 goes into the denominator.

9. It follows that the Ca/Si-ratio of hardened cement paste can be calculated according to eq. 7:

$$\frac{Ca}{Si}(\text{cement paste}) = \frac{m_{CH} + 1.5 \cdot m_{CSHJenD} + 1.33 \cdot m_{CSHJenH} + 1.25 \cdot m_{CSHTobD} + 0.667 \cdot m_{CSHTobH} + 3 \cdot \Sigma m_{Si-Hg} - m_{CO_2}}{0.667 \cdot m_{CSHJenD} + m_{CSHJenH} + m_{CSHTobD} + m_{CSHTobH} + 0.84 \cdot \Sigma m_{Si-Hg} + m_{SiO_2}}$$

In this equation, the amount of Ca (in moles) corresponds to the portlandite-equivalent of the main Ca-containing cement phases minus the amount of CO_2 (in moles) leading to carbonation, while the amount of Si (in moles) corresponds to the SiO_2-equivalent of these cement phases plus the amount of microsilica (in moles) present in the AGT as microfine and fast reacting SiO_2.

10. For the waste group classification, if the calculated Ca/Si-ratio of the hardened cement paste is ≥ 1.1, the AGT is assigned to WG1, while if the Ca/Si is < 1.1, the AGT is assigned to WG2. For the AGTs which belong to WG2, a reduced sorption capacity, in particular for anions, is to be assumed (see Tab. 2-1). The calculated Ca/Si ratios for the waste types and the assignement to waste groups are shown in Appendix A.

11. For the assignement of the corrosion rates, if the calculated Ca/Si-ratio of the hardened cement paste is ≥ 0.8, pH is ≥ 10.5 and lower metal corrosion rates are used for gas generation calculations. On the opposite, if the Ca/Si-ratio is < 0.8, pH is < 10.5 and higher metal corrosion rates are to be assumed (see Tab. 2-1).

2.3.4 Waste types without solidifying cementitious material

Some material waste are not solidified with cement (e.g., reactor internals, bituminised ion exchange resins). Hence, the pH for the AGTs containing such substances is in the near-neutral range. In some of these AGTs organic materials can be present, which degrade to CO_2 and thus may also affect the surrounding cement in the near-field. If, according to the MIRAM-RBG data base, such AGTs, which do not contain a cement matrix which is used for the conditioning of the other AGTs, are packed in disposal containers and surrounded by container infill mortar, the same approach than presented in Section 2.2.2 is used to calculate the buffer capacity of the near-field. If the calculated Ca/Si ratio of the cement paste becomes < 1.1, they are assigned to WG2. If the Ca/Si-ratio is < 0.8, elevated corrosion rates are assigned to metals if present. For such AGTs, neutral pH values are assigned for the gas generation models. This includes the assumption that the entire inventory of organic materials is degraded, which in reality is restricted due to the limited availability of water within the waste matrix and near-field (Kosakowski et al. 2023) and dependent on the saturation of the repository (see e.g. Martin et al. 2023), and further dependent on the kinetic rates of the degradation of organic materials (see Guillemot et al. 2023). Assuming complete degradation of the organic materials over the safety-relevant period of 100 ka was furthermore assumed to be very conservative, especially for ion exchange resins and bitumen.

2.3.5 Amount of waste with reduced sorption behaviour and waste with high corrosion rates

According to the model approach presented in Section 2.3, out of a conditioned volume of 42'860 m^3 of waste, 3'780 m^3 of conditioned waste has a Ca/Si-ratio < 1.1 and therefore a reduced sorption capacity of the cement paste is calculated according to the model approach.

With respect to the selection of the appropriate corrosion rates for the gas generation calculations, 1'877 m^3 of the conditioned waste has a Ca/Si-ratio < 0.8 and therefore the pH of the calculated cement pore solution is < 10.5 according to Fig. 2-2. For these AGTs, higher corrosion rates for the metals are to be assigned.

2.4 Complexing agents

Some AGTs contain substances that may have a negative influence on radionuclide retention because the radionuclides form complexes with complexing ligands which can increase their mobility. Such complexing ligands are ISA, GLU, EDTA, NTA and cyanides (see Bradbury & van Loon 1997, Schwyn 2008, Cloet et al. 2014, Hummel et al. 2022). Furthermore, nitrate and nitrite are strong oxidisers; a high amount in the waste may therefore lead to local oxidising conditions and consequently increase the mobility of some redox-sensitive radionuclides. Wastes which contain these substances in concentrations higher than defined limits are assigned to WG2. For these AGTs, ligand concentrations in the calculated pore water are substantial and can have a possible impact on the radionuclide concentrations, if the complexing ligands and radionuclides are released into the near-field. AGTs that do not contain such substances or contain them in concentrations lower than the defined limits are assigned to WG1. For the calculation of the concentrations in pore water, the total volume of the cementitious near-field is assumed to be twice the volume of the waste packages (simplified assumption)[2]. The cement paste density in the near-field is assumed to be 350 kg/m^3 and the porosity 0.2 (Nagra 2014b)[3].

2.4.1 Isosaccharinic acid (ISA)

Under alkaline conditions, cellulose is partially degraded, with ISA ($C_6H_{12}O_6$) being an important degradation product that forms strong complexes with some radionuclides (especially trivalent and tetravalent lanthanides and actinides; see Gaona et al. 2008, Tits et al. 2005), which increases the solubility and reduces the retention of these radionuclides (Wieland 2014). ISA sorbs on the surfaces of the C-S-H phases in the cement paste and therefore only a portion of ISA is dissolved in the pore water. The ISA concentration in the pore water, which determines whether and to what extent radionuclides form complexes with ISA, is calculated according to Bradbury & Van Loon (1997). Cloet et al. (2014) assumed that 10% of the cellulose decomposes to ISA under alkaline conditions, the cementitious near-field contains 350 kg of cement paste per m^3 and has a porosity of 20%. The quantity of cellulosic materials is the sum of cotton and cellulose, which are listed as standard materials in the MIRAM-RBG database (Nagra 2023a).

Consideration of partial cellulose degradation and ISA sorption to cement is done according to equation 8 (Bradbury & Van Loon 1997, Cloet et al. 2014):

$$\varepsilon c_{eq}\left[10^3\,\frac{L}{m^3}\right]+Z\,\frac{K_{ISA}q_{ISA}c_{eq}}{1+K_{ISA}c_{eq}}=\frac{fA}{M_{ISA}}\left[10^3\,\frac{g}{kg}\right] \tag{8}$$

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2 The volume of cementitious material of the massive inner-shell tunnel support and the backfill mortar (without the outer-shell tunnel support) per clearance volume of the storage vault comprises to ca. 55 – 60 vol.-%., i..e. the waste volume amounts to 40-45%. This implies that the waste packages are surrounded by at least the same volume of cementitious material. The use of the value of 0.5, or the reciprocal of 2, is a conservative assumption for the calculation of the cementitious material content of the near-field, as it underestimates the amount of cement surrounding the waste.

3 The calculated density of the cement paste, accounting for current concepts, is > 450 kg/m^3 and ca. 20 vol.-% porosity (Nagra internal document). Therefore, assuming a cement paste density of 350 kg/m^3 for the calculations is conservative. This value has been selected for consistency reasons as this density is applied for the cement sorption data base report (Tits & Wieland 2023), the calculated cement pore water (see Kosakowski et al. 2023 Appendix 1) and calculated radionuclide solubilities (Hummel et al. 2022).

where,

ISA concentration in pore water c_{eq}:	[mol/L]
Loading cellulosic materials (A):	according to the MIRAM waste inventory [kg/m^3]
Proportion of cellulose decomposing to ISA (f):	0.1 [-]
Porosity (ε):	0.2 [-]
Cement paste quantity (Z):	350 [kg/m^3]
Sorption affinity constant (K_{ISA}):	690 [L/mol]
Molar mass (M_{ISA}):	180.16 [g/mol]
Sorption capacity of the cement paste for ISA (q_{ISA}):	0.17 [mol/kg]

The maximum amount of ISA calculated in the cement pore water results in 8.6×10^{-4} mol/L. If the ISA concentration in the cement pore water (c_{eq}) exceeds the limit of 10^{-4} [mol/L], the possible complexation of radionuclides with ISA is strongly increased (Bradbury & Van Loon 1997) and therefore the waste is assigned to WG2 (Schwyn 2008, Cloet et al. 2014). This amounts in a conditioned waste volume[4] of 340 m^3 of ISA-bearing waste assigned to WG2 out of a conditioned ISA-containing waste volume of 1'130 m^3.

2.4.2 Gluconic acid (GLU)

GLU ($C_6H_{12}O_7$) has been used in cement formulations as additive such as a superplasticiser and as a retardant during waste solidification and, like ISA, could lead to sorption reduction of the trivalent and tetravalent lanthanides and actinides (Wieland 2014). Gluconic acid also sorbs at the cement surface, so only a portion of the GLU is dissolved in the pore water. The GLU concentration in the pore water, which determines whether and to what extent radionuclides are complexed, is calculated according to Bradbury & van Loon (1997). The cemented near-field is assumed to contain 350 kg of cement paste per m^3 and to have a porosity of 20 %. The amount of GLU is derived from the MIRAM-RBG database (Nagra 2023a). Consideration of GLU sorption to cement is done according to equation 9 (Bradbury & Van Loon 1997, Cloet et al. 2014):

$$\varepsilon c_{eq}\left[10^3\,\frac{L}{m^3}\right] + Z\,\frac{K_{Glu}q_{Glu}c_{eq}}{1+K_{Glu}c_{eq}} = \frac{A}{M_{Glu}}\left[10^3\,\frac{g}{kg}\right] \qquad (9)$$

GLU concentration in pore water c_{eq}:	[mol/L]
Loading GLU (A):	according to the MIRAM waste inventory [kg/m^3]
Porosity (ε):	0.2 [-]
Cement paste quantity (Z):	350 [kg/m^3]
Sorption affinity constant (K_{GLU}):	3'360 [L/mol]
Molar mass (M_{GLU}):	196.16 [g/mol]
Sorption capacity of the cement stone for GLU (q_{GLU}):	0.57 [mol/kg]

[4] The conditioned waste volume refers to the primary waste package such as the conditioned 200 l drums from the operational waste or the LC-84 containers for decommissioning waste (list not complete, see MIRAM-RBG data base).

AGTs exceeding a GLU concentration in cement pore water (c_{eq}) of 10^{-5} mol/L are assigned to WG2 according to the calculated approach in Bradbury & van Loon (1997) and Cloet et al. (2014). Out of a conditioned waste volume of 15'707 m^3 containing minor amounts of gluconic acids, no waste is exceeding this concentration limit of 10^{-5} mol/L.

2.4.3 Ethylenediaminetetraacetic acid (EDTA)

EDTA ($C_{10}H_{14}N_2O_8Na_2$) is used in nuclear decontamination applications, because of its ability to bind radionuclides and remove them from contaminated surfaces (Keith-Roach 2008). In a previous study used in the scope of the waste classification reports of Schwyn (2008) and Cloet et al. (2014), it was assumed on the basis of the available thermodynamic data at that time that only a few cations such as Ni and Pb form complexes with EDTA, as derived in Hummel (1993). In the last years, new thermodynamic data for EDTA complexation of radionuclides have become available and have been included in the updated PSI-Nagra thermodynamic database (Hummel & Thoenen 2022 and references therein). Furthermore, with the recently discovered existence of a quaternary Ca – Pu(IV) – OH – EDTA complex, a strong increase in Pu solubility, and by chemical analogy, also for Np and U, was predicted (DiBlasi et al. 2021). As a result of these quaternary complexes, the solubilities of Ni, Np, Pu and U under the specific chemical conditions expected in a cement pore water representing stage II of the cement degradation, were re-assessed by thermodynamic modelling, which led to an increase of the solubilities by a factor 142, 1'610, 15'500, 563'000, respectively (Hummel et al. 2022). The maximum EDTA concentrations reached in the pore water results in 2.5×10^{-2} mol/L, while the thermodynamic calculations conservatively considered 0.05 molal EDTA to cover uncertainties. For the sorption of radionuclides on hardened cement paste, as reported by Tits & Wieland (2023), it is assumed that the increase of the EDTA solubility leads to a corresponding reduction of sorption on hardened cement paste, which means that higher sorption reduction factor have to be taken into account. As no experimental evidence is currently available that the Ca-EDTA compound adsorbs on cement phases, the increased mobility due to the formation of ternary Ca-EDTA-radionuclide complexes in the cement pore water needs to be considered for reasons of conservatism.

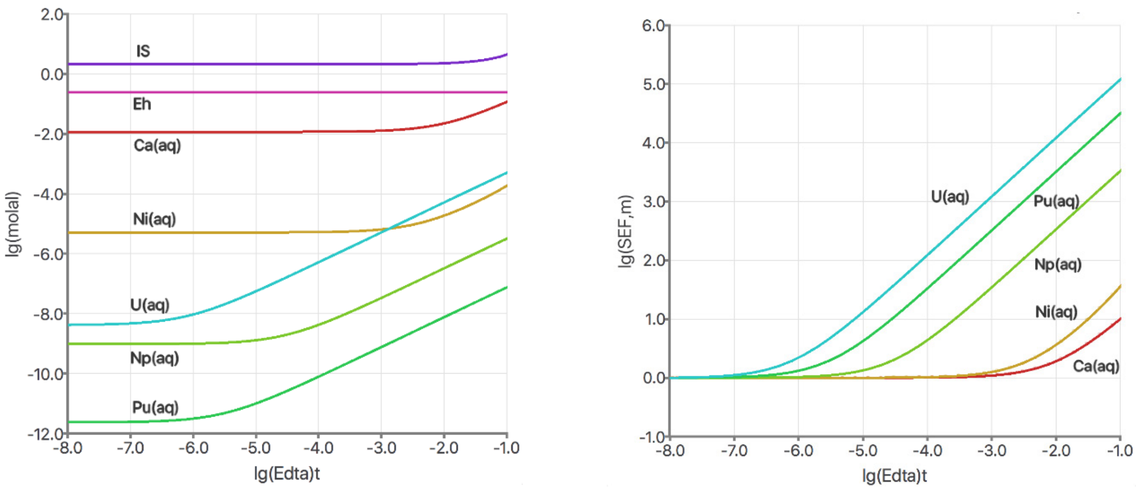

Fig. 2-4: a) Dependencies of limiting solubilities of EDTA-sensitive cations (in $\log_{10} m$) and b) solubility enhancement factors (in $\log_{10}$ SEF) as a function of Na_2H_2EDTA loading in $\log_{10}$(mol per kg pore water)

From Hummel et al. (2022)

Hummel et al. (2022) modelled the impact of increasing Na_2H_2EDTA loadings from 10^{-8} M to 10^{-1} M to assess how EDTA affects the solubility limits of five radionuclides in cement pore water, that is in the presence of Ca, for degradation stage II for the anoxic systems (Fig. 2-4a). At low EDTA-concentration, the solubility plot has a horizontal part where the solubility is not sensitive to EDTA addition; a linear slope part where the solubility increases directly proportional (with slope 1) to the addition of EDTA; and a non-linear area in between, about 1.5 log units wide and 1 log unit high. Another feature is that the location of these three regions is different for the different cations.

For better illustration of the effect of EDTA on solubility, "solubility enhancement factors" (SEF) are plotted in log-log scale (Fig. 2-4b). They can be obtained by simply subtracting the $\log_{10}$ of total dissolved molality of the element in the "insensitivity region" (i.e., at 10^{-8} *m* EDTA loading) from the respective value of the current loading (Hummel et al. 2022). Uranium solubility, which is the one that is the most sensitive to EDTA complexation, increases by 1 order of magnitude at increasing EDTA concentration > 10^{-5} mol/L.

The increase of U solubility by one order of magnitude above 10^{-5} M is considered to be significant. Hence, AGTs exceeding an EDTA concentration in cement pore water of 10^{-5} mol/L are assigned to WG2. In total, a conditioned waste volume of 569 m^3 containing EDTA exists and all of them exceed the concentration levels and are therefore all assigned to WG2.

2.4.4 Nitrilotriacetic acid (NTA)

NTA accounts for intermediate range complexes with aminocarboxylic acids (Hummel 1993). Some waste types contain Na_3NTA ($C_6H_6NO_6Na_3$), which is added to slurries with the aim of solidifying them in cement and further, NTA is used in nuclear decontamination applications, because of its ability to bind radionuclides and remove them from contaminated surfaces[5] (Keith-Roach 2008). In SGT Stage 2, complexation with NTA was assumed to be similar to EDTA, so that complexation with NTA only affects Ni and Pb and is accordingly taken into account when assigning sorption reduction factors (Wieland 2014). However, it is known that the hexa-dentate EDTA forms much stronger complexes than the tetra-dentate NTA complexes (e.g., Keith-Roach 2008). The stability constants for radionuclide-NTA complexes are generally several orders of magnitude lower than for EDTA complexes, such as in the case of Mn-NTA complexes (Erk et al. 1996). It is also noted that NTA has a much better biodegradability than EDTA (Keith-Roach 2008). NTA and EDTA can also form mixed metal complexes, which are more stable than the pure EDTA complexes. However, the interaction and competition for metal ions is very complex as indicated by Keith-Roach (2008). Up to date, there are no new thermodynamic data available for radionuclide complexation with NTA. Due to the lack of available thermodynamic data for NTA and mixed EDTA-NTA complexes, it was therefore decided for RBG to base the NTA criterion on thermodynamic calculations by Hummel (1993), similarly as in SGT Stage 2.

AGTs that exceed an NTA concentration in the cement pore water of 2×10^{-2} mol/L are assigned to WG2 (Schwyn 2008, Cloet et al. 2014). In total, there is a conditioned volume of 283 m^3 packaged waste containing substances classified as NTA. Thereof, 109 m^3 are to be assigned to WG2. It is to be noted that NTA concentrations in the cement pore water of wastes of WG2 range from 5.7×10^{-2} to 6.5×10^{-2} mol/L, while the waste with the highest NTA concentration, which belongs to WG1, has 3.2×10^{-4} mol/L NTA in the pore water, indicating that there is a gap in the concentration levels. Furthermore, it is to be noted that no wastes containing NTA also has EDTA, which means that no mixed NTA-EDTA metal complexes form in these AGTs.

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[5] NTA is a collective term of substances which, in the context of the material conversions for the MIRAM 14 and MIRAM-RBG database, represents complexing ligands in slurries and decontamination agents in concentrates.

2.4.5 Cyanide

Cyanide (also called Prussian blue) ($Fe_4[Fe(CN)_6]_3$) is used to bind caesium in liquid wastes and could lead to the release of cyanide. Although cyanide is highly soluble in alkaline solutions (Hummel 2004, Schwyn et al. 2003), photochemical decomposition into cyanide is considered unlikely because hexacyanoferrate is stable in the dark. Since the effect of gamma irradiation is not known, a total dissolution and decomposition of hexacyanoferrate is assumed (Wieland 2014) as the worst-case scenario for the assessment of a potential detrimental effect. Furthermore, because microbiological decomposition of hexacyanoferrate cannot be ruled out, sorption reduction is applied for the radionuclides (Ni, Co) that could form CN complexes (Wieland 2014). AGTs that exceed a CN^- concentration in the cement pore water of 10^{-5} mol/L are assigned to WG2 (Schwyn 2008, Cloet et al. 2014). This limit has taken over from Bradbury & Sarott (1994) due to the lack of newly available thermodynamic data to re-assess CN^- complexation.

Chemical formula:	$Fe_4[Fe(CN)_6]_3$
Molar mass ($M_{Prussian\ blue}$):	859.3 [g/mol]
Number CN- per formula mass (N_{CN}):	18

Prussian blue concentration in the pore water are calculated according to equation 10:

$$CN^- \text{ [mol]} = \text{Mass}_{\text{Prussian blue}} \text{ [g]} / M_{\text{Prussian blue}} \times N_{CN} \tag{10}$$

With this limit, all AGTs containing cyanides are assigned to WG2. This corresponds to a conditioned volume of 192 m^3 which consists of sludges and concentrates conditioned in cement.

2.4.6 Nitrate/Nitrite

Various AGTs contain nitrate and nitrites, e.g., ammoniumnitrate (NH_4NO_3), calciumnitrate ($Ca(NO_3)_2$), chromium-III-nitrate ($Cr(NO_3)_3$, iron-II-nitrate ($Fe(NO_3)_2$), potassiumnitrate (KNO_3), potassiumnitrite (KNO_2), sodiumnitrate ($NaNO_3$) and silvernitrate ($AgNO_3$) (Nagra 2023a). It is to be assumed that all these salts are highly soluble and will get released once the waste gets in contact with water. NO_3^- will therefore be available as oxidant to oxidise other substances (e.g. chemical complexes, metals). Consequently, this may lead to a higher mobility of some redox sensitive radionuclides.

To define an upper limit for WG1, the nitrate oxidation capacity was compared to the oxidation capacity of the oxygen trapped in the pores of the near-field after closure of the repository.

Half-cell reaction for oxygen:	$O_2 + 2H_2O + 4e^- = 4OH^-$
Half-cell reaction for nitrate:	$NO_3^- + 3H_2O + 5e^- = 0.5N_2 + 6\ OH^-$

According to the ideal gas law the amount of oxygen in the pore space of 1 m^3 cavern is 1.7 mol corresponding to 1.4 mol of nitrate considering the number of electrons in the above half-cell reactions.

Assumptions:

Atmospheric pressure:	10^5 Pa
Partial pressure (O_2):	2.1×10^4 Pa (changes of height above sea level and temperature neglected)
Porosity:	0.2
Temperature:	293 K

The comparison of the oxidation capacity between nitrate and oxygen may not be ideal since the waste may be protected from air during the aerobic phase when the waste packages are still intact. After emplacement in the cavern, the expected exposure of a repository to oxygen is probably higher than the estimate given above as the repository will be open (and exposed to air), while nitrate is localised in the waste.

Therefore, the upper limit for nitrate in WG1 should be chosen clearly above the calculated oxidation capacity of oxygen since a too restrictive limit leads to an unnecessary assignment of WG2. Assuming complete dissolution of nitrate in the pore water, the above comparison with oxygen results in a concentration of 0.007 mol/L. An upper limit for WG1 of 0.05 mol/L is proposed which is clearly higher than this value but less than ten times the calculated concentration. Nitrite, which has a lower oxidation capacity, is not considered separately, but its amount is added to the one of nitrate.

There is a total conditioned volume of 2'665 m^3 of packaged waste containing nitrates (mostly anionic exchange resins, their evaporation concentrates and precipitated sludges). Applying the upper limit of 0.05 mol/L for WG1 results in a conditioned waste volume of 121 m^3 assigned to WG2. Maximum concentrations were observed for slurries from pickling produced at PSI with calculated concentrations of 0.48 mol/L in the pore water.

3 Summary of waste group criteria

A summary of the criteria for waste group classification and the selection of the appropriate corrosion rates is presented in Tab. 3-1.

Tab. 3-1: Compilation of criteria and indicators for the allocation of AGTs into the WG1 and WG2 and maximum concentrations in near-field pore water and the pH criteria

Criteria	Sorption criteria	ISA	Gluconic acid	EDTA	NTA	Cyanide	Nitrate/ Nitrite	pH*
Indicator	Ca/Si-ratio of cement phase	ISA concen-tration in cement pore water	Gluconic acid concentration in cement pore water	EDTA concentration in cement pore water	NTA concentration in cement pore water	CN^- concentration in cement pore water	NO_3^- concentration in cement pore water	pH of cement pore water in waste package type
Upper limit waste group 1	If Ca/Si-ratio ≥ 1.1, WG1	10^{-4} mol/L	10^{-5} mol/L	10^{-5} mol/L	2×10^{-2} mol/L	10^{-5} mol/L	5×10^{-2} mol/L	If Ca/Si-ratio ≥ 0.8, pH ≥ 10.5*
Maximum conc. [mol/L]		8.6×10^{-4}	5.1×10^{-6}	2.5×10^{-2}	6.5×10^{-2}	0.18	0.48	

* The pH criteria is not used for the waste group classification but is used to select the corresponding corrosion rates for the gas generation models.

Applying the criteria above (Tab. 3-1) therefore allows to assign the AGTs to WG1 and WG2 by means of model calculations implemented in a spread sheet (not publicly available). These calculations serve the purpose to discriminate waste with elevated concentrations of substances that may reduce radionuclide retention, due to the complexation of radionuclides by the complexing ligands. For the wastes belonging to WG2, sorption reduction factors that account for reduced sorption of radionuclides (derived from the database from Tits & Wieland 2023) will be applied for the consequence analysis calculations for RBG (Nagra 2024a). Out of a total conditioned waste volume of 42'860 m^3 according to the MIRAM-RBG database (Nagra 2023a), a volume of 4'460 m^3 of conditioned waste is assigned to WG2 (i.e. 10.4 vol.-%). For the packaged waste volume, according to the assignment of the primary waste packages to the disposal container according to the MIRAM-RBG database, out of a total volume of 83'841 m^3 packaged waste, 17'644 m^3 is assigned to WG2 (21.0 vol.-%). Thereof, waste containing EDTA (all assigned to WG2) makes up the largest fraction of the waste in WG2 with a conditioned waste volume of 569 m^3 (1.3 vol.-%) which corresponds to a packaged volume of 2'489 m^3 (i.e., 2.97 vol.-% of the total volume to be disposed of). As no experimental evidence are currently available that the Ca-EDTA compound adsorbs on cement phases, the increased mobility due to the presence of EDTA in the cement pore water and the formation of ternary Ca-EDTA-radionuclide complexes is considered for the current stage of the project.

With respect to the selection of the appropriate corrosion rates for the gas generation calculations, 1'877 m^3 of the conditioned waste has a Ca/Si-ratio < 0.8 and therefore the pH of the calculated cement pore solution is < 10.5 according to Fig. 2-2. For these waste types, higher corrosion rates for the metals within the waste package types are to be assigned.

It should be recalled that the assumptions made for this report are based on a so-called mixing tank approach with a homogeneous, fully saturated near-field as used for the dose calculations. It is to be noted that partially saturated conditions within the L/ILW near-field dominate the time of consideration within a L/ILW repository, as shown by Papafotiou & Senger (2016) and explained in Martin et al. (2023), and the degradation of organics also occurs at kinetic rates (see Guillemot et al. 2023) and not instantaneously. Therefore, the consideration that all radionuclides are released instantaneously into a fully saturated near-field and subject to complexation in the presence of maximum ligand concentrations, as applied for consequence analysis calculations, is a very conservative assumption.

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App. A Waste group classification of waste package types

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
		Theoretical Ca/Si-ratio of cement paste	ISA-conc. in cement pore water	GLU-conc. in cement pore water	EDTA-conc. in cement pore water	NTA-conc. in cement pore water	CN-conc. in cement pore water	NO3 and NO2 conc. in cement pore water		If theoretical Ca/Si-ratio of cement paste < 0.8, pH < 10.5; if no initial cement, pH < 10.5 unless Ca/Si-ratio > 0.8
Classification criteria		*1.1* [-]	*1.0E-04* [mol/L]	*1.0E-05* [mol/L]	*1.0E-05* [mol/L]	*2.0E-02* [mol/L]	*1.0E-05* [mol/L]	*5.0E-02* [mol/L]		*0.80* [-]
J-B-000007A	BA-B-S-F2-SMA	1.95	0	0	0	7.4E-05	**1.7E-01**	5.0E-05	**WG2**	pH > = 10.5
J-B-000008A	BA-B-S-F2-SMA	1.49	0	0	0	7.1E-05	**1.6E-01**	4.8E-05	**WG2**	pH > = 10.5
J-B-000009A	BA-B-S-F2-SMA	1.38	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000010A	BA-B-S-F2-SMA	1.35	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000014	BA-B-K-F2-SMA	1.98	3.3E-08	0	0	2.4E-04	0	0	WG1	pH > = 10.5
J-B-000034	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000038	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000041	BA-B-HP-F1-SMA	**-2.50**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000042	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000043	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000044	BA-B-HP-F1-SMA	**-2.50**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000045	BA-B-HP-F1-SMA	**-2.49**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000046	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000047	BA-B-HP-F1-SMA	**-3.14**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000049	BA-B-HP-F2-SMA	1.23	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000050	BA-B-HP-F2-SMA	1.23	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-B-000051	BA-B-HP-F2-SMA	1.22	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000052	BA-B-HP-F2-SMA	1.22	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000054	BA-B-HP-F2-SMA	**1.07**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-B-000055	BA-B-F-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000056	BA-B-F-F2-SMA	1.82	5.4E-05	0	0	0	0	0	WG1	pH > = 10.5
J-B-000057	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000058	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000059	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000060	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000061	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000062	BA-B-X-F2-SMA	1.20	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000063	BA-B-X-F2-SMA	1.51	0	8.6E-07	0	0	0	0	WG1	pH > = 10.5
J-B-000065	BA-B-F-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000066	BA-B-F-F2-SMA	1.81	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000067	BA-B-F-F2-SMA	1.82	5.4E-05	0	0	0	0	0	WG1	pH > = 10.5
J-B-000069	BA-B-F-F2-SMA	1.80	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000072	BA-B-HP-F1-SMA	**-3.13**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000073	BA-B-F-F2-SMA	1.70	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000075	BA-B-K-F2-SMA	2.00	4.4E-08	0	0	3.2E-04	0	0	WG1	pH > = 10.5
J-B-000078	BA-PV-AF-F2-SMA	1.40	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000079	BA-PV-AF-F2-SMA	**0.99**	0	1.5E-06	0	0	0	0	**WG2**	pH > = 10.5
J-B-000080	BA-PV-AF-F2-SMA	**0.99**	0	1.5E-06	0	0	0	0	**WG2**	pH > = 10.5
J-B-000081	BA-PV-AF-F2-SMA	**0.71**	0	1.7E-06	0	0	0	0	**WG2**	pH < 10.5
J-B-000082	BA-PV-AF-F2-SMA	1.62	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-B-000083	BA-PV-AF-F2-SMA	1.16	0	1.5E-06	0	0	0	0	WG1	pH > = 10.5
J-B-000085	BA-PV-AF-F2-SMA	1.16	0	1.5E-06	0	0	0	0	WG1	pH > = 10.5
J-B-000086	BA-PV-AF-F2-SMA	1.06	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-B-000087	BA-PV-AF-F2-SMA	**0.71**	0	1.7E-06	0	0	0	0	**WG2**	pH < 10.5
J-B-000088	BA-B-HP-F1-SMA	**-3.13**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000093	BA-B-F-F2-SMA	1.70	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000094	BA-B-F-F2-SMA	1.80	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000095	BA-B-K-F2-SMA	2.00	4.4E-08	0	0	3.2E-04	0	0	WG1	pH > = 10.5
J-B-000098	BA-B-X-F2-SMA	**0.99**	0	4.1E-07	0	0	0	0	**WG2**	pH > = 10.5
J-B-000099	BA-B-HP-F2-SMA	**-0.80**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000100	BA-B-X-F2-SMA	1.40	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000101	BA-B-X-F2-SMA	**1.04**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-B-000102	BA-B-X-F2-SMA	1.17	0	5.7E-07	0	0	0	0	WG1	pH > = 10.5
J-B-000103	BA-B-X-F2-SMA	**0.86**	0	5.7E-07	0	0	0	0	**WG2**	pH > = 10.5
J-B-000108	BA-B-HP-F1-SMA	**-3.13**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000109	BA-B-HP-F2-SMA	**-0.80**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000110	BA-B-HP-F2-SMA	**-0.51**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000111	BA-B-S-F2-SMA	1.38	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000112	BA-B-S-F2-SMA	1.38	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000113	BA-B-S-F2-SMA	1.38	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000114	BA-B-S-F2-SMA	1.38	0	0	0	8.0E-05	**1.8E-01**	5.4E-05	**WG2**	pH > = 10.5
J-B-000115	BA-B-S-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-B-000116	BA-B-HP-F2-SMA	**-0.53**	0	3.8E-07	0	0	0	0	**WG2**	pH < 10.5
J-B-000118	BA-B-F-F2-SMA	1.32	4.5E-06	9.8E-07	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-B-000119	BA-B-F-F2-SMA	1.40	4.7E-07	1.2E-06	0	0	0	0	WG1	pH > = 10.5
J-B-000120	BA-B-X-F2-SMA	**0.50**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000121	BA-B-X-F2-SMA	1.66	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000122	BA-B-X-F2-SMA	**0.29**	0	9.2E-07	0	0	0	0	**WG2**	pH < 10.5
J-B-000123	BA-B-X-F2-SMA	1.88	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000124	BA-B-X-F2-SMA	1.85	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000125	BA-B-X-F2-SMA	1.43	0	9.0E-07	0	0	0	0	WG1	pH > = 10.5
J-B-000127	BA-B-X-F2-SMA	**0.76**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-B-000128	BA-B-X-F2-SMA	1.62	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000129	BA-B-X-F2-SMA	1.64	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-000130	BA-B-X-F2-SMA	**0.57**	0	9.7E-07	0	0	0	0	**WG2**	pH < 10.5
J-B-910001	BA-B-HP-F2-SMA	**-0.53**	0	3.8E-07	0	0	0	0	**WG2**	pH < 10.5
J-B-910002	BA-B-S-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-B-910003	BA-B-F-F2-SMA	1.32	4.5E-06	9.8E-07	0	0	0	0	WG1	pH > = 10.5
J-B-910010	BA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-B-920001	RA-B-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-B-9320141	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320151	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320152	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320161	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320162	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320171	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320181	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320182	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-B-9320183	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320191	SA-B-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-B-9320211	SA-B-MS-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320221	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320222	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320223	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320224	SA-B-ME-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320231	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320232	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320233	SA-B-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-932024	SA-B-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-932025	SA-B-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9320301	SA-B-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321011	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-B-9321201	SA-B-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321203	SA-B-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321204	SA-B-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321301	SA-B-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321303	SA-B-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321304	SA-B-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321311	SA-B-B-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-9321320	SA-B-B-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-B-932200	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-B-932201	SA-B-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-B-932202	SA-B-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-B-932203	SA-B-X-F2-SMA	1.47	0	6.5E-07	0	0	0	0	WG1	pH > = 10.5
J-B-932210	SA-B-H-M2-SMA	1.48	0	0	0	0	0	0	WG1	No init. Cement
J-B-932211	SA-B-H-M2-SMA	1.72	0	0	0	0	0	0	WG1	No init. Cement
J-G-000003	BA-G-KB-F2-SMA	**-0.68**	0	0	0	0	0	0	WG1	No init. Cement
J-G-000004	BA-G-KB-F2-SMA	**-0.72**	0	0	0	0	0	0	WG1	No init. Cement
J-G-000005	BA-G-KB-F2-SMA	1.24	0	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-000006	BA-G-KB-F2-SMA	1.38	0	0	**1.8E-02**	0	0	0	**WG2**	No init. Cement
J-G-000007	BA-G-KB-F2-SMA	1.42	0	0	**1.7E-02**	0	0	0	**WG2**	No init. Cement
J-G-000008	BA-G-KB-F2-SMA	1.42	0	0	**1.7E-02**	0	0	0	**WG2**	No init. Cement
J-G-000009	BA-G-KB-F2-SMA	1.18	0	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-000010	BA-G-KB-F2-SMA	1.25	0	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-000011	BA-G-KB-F2-SMA	1.35	0	0	**1.8E-02**	0	0	0	**WG2**	No init. Cement
J-G-000012	BA-G-KB-F2-SMA	1.37	0	0	**1.8E-02**	0	0	0	**WG2**	No init. Cement
J-G-000013	BA-G-KB-F2-SMA	1.28	0	0	**1.9E-02**	0	0	0	**WG2**	No init. Cement
J-G-000014	BA-G-KB-F2-SMA	1.46	0	0	**1.7E-02**	0	0	0	**WG2**	No init. Cement
J-G-000015	BA-G-KB-F2-SMA	**0.72**	7.0E-05	0	**2.4E-02**	0	0	0	**WG2**	No init. Cement
J-G-000016	BA-G-KB-F2-SMA	**0.81**	6.7E-05	0	**2.3E-02**	0	0	0	**WG2**	No init. Cement
J-G-000017	BA-G-KB-F2-SMA	**0.95**	6.2E-05	0	**2.2E-02**	0	0	0	**WG2**	No init. Cement
J-G-000018	BA-G-KB-F2-SMA	**0.95**	6.2E-05	0	**2.2E-02**	0	0	0	**WG2**	No init. Cement
J-G-000019	BA-G-KB-F2-SMA	**0.63**	7.2E-05	0	**2.5E-02**	0	0	0	**WG2**	No init. Cement
J-G-000020	BA-G-KB-F2-SMA	**0.72**	6.9E-05	0	**2.4E-02**	0	0	0	**WG2**	No init. Cement
J-G-000021	BA-G-KB-F2-SMA	**0.86**	6.5E-05	0	**2.3E-02**	0	0	0	**WG2**	No init. Cement
J-G-000022	BA-G-KB-F2-SMA	**0.77**	6.8E-05	0	**2.4E-02**	0	0	0	**WG2**	No init. Cement

Waste type	**Waste sort**	**Sorption criteria**	**Cellulose-like materials**	**Gluconic acid**	**EDTA**	**NTA**	**Cyanide**	**Nitrate + Nitrite**	**Waste group**	**pH criteria**
J-G-000023	BA-G-KB-F2-SMA	**1.00**	6.1E-05	0	**2.1E-02**	0	0	0	**WG2**	No init. Cement
J-G-000024	BA-G-HB-F2-SMA	**-0.62**	0	0	0	0	0	0	WG1	No init. Cement
J-G-000025	BA-G-HB-F2-SMA	**-0.84**	0	0	0	0	0	0	WG1	No init. Cement
J-G-000026	BA-G-KB-B1-SMA	**-1.19**	0	0	**3.8E-03**	0	0	0	**WG2**	pH < 10.5
J-G-000027	BA-G-KB-B1-SMA	**-1.30**	1.3E-05	0	**4.7E-03**	0	0	0	**WG2**	pH < 10.5
J-G-000028	BA-G-HB-B1-SMA	**-1.33**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-G-000029	BA-G-HB-F2-SMA	**-0.99**	0	0	0	0	0	0	WG1	No init. Cement
J-G-000030	BA-G-X-F2-SMA	1.36	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000031	BA-G-X-F2-SMA	1.74	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000032	BA-G-X-F2-SMA	1.76	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000033	BA-G-X-F2-SMA	1.32	0	1.2E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000035	BA-G-X-F2-SMA	1.51	0	1.1E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000036	BA-G-X-F2-SMA	1.41	0	1.5E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000037	BA-G-X-F2-SMA	1.35	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000038	BA-G-X-F2-SMA	1.37	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000039	BA-G-X-F2-SMA	1.35	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000042	BA-G-H-F2-SMA	1.91	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000043	BA-G-H-F2-SMA	1.91	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000044	BA-G-X-F2-SMA	1.95	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000045	BA-G-X-F2-SMA	1.11	0	6.1E-07	0	0	0	0	WG1	pH > = 10.5
J-G-000046	RA-G-MS-B1-SMA	**-0.77**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-G-000047	BA-G-X-F2-SMA	1.79	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000049	BA-G-KB-F2-SMA	1.27	0	0	**1.9E-02**	0	0	0	**WG2**	No init. Cement
J-G-000050	BA-G-KB-F2-SMA	1.45	0	0	**1.7E-02**	0	0	0	**WG2**	No init. Cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-G-000051	BA-G-KB-F2-SMA	**0.76**	6.8E-05	0	**2.4E-02**	0	0	0	**WG2**	No init. Cement
J-G-000052	BA-G-KB-F2-SMA	**0.99**	6.1E-05	0	**2.1E-02**	0	0	0	**WG2**	No init. Cement
J-G-000055	BA-G-X-F2-SMA	1.32	0	1.2E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000056	BA-G-X-F2-SMA	1.51	0	1.1E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000057	BA-G-X-F2-SMA	1.11	0	6.2E-07	0	0	0	0	WG1	pH > = 10.5
J-G-000059	BA-G-X-F2-SMA	1.35	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000060	BA-G-KB-F2-SMA	**-0.61**	0	0	0	**6.5E-02**	0	0	**WG2**	No init. Cement
J-G-000061	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000062	BA-PV-AF-F2-SMA	**1.00**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-G-000063	BA-PV-AF-F2-SMA	**0.99**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-G-000064	BA-PV-AF-F2-SMA	**0.99**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-G-000065	BA-PV-AF-F2-SMA	1.60	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000066	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000067	BA-PV-AF-F2-SMA	1.60	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-000068	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000069	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000070	BA-PV-AF-F2-SMA	**1.08**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-G-000071	BA-PV-AF-F2-SMA	**1.06**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-G-000072	BA-PV-AF-F2-SMA	**0.75**	0	1.5E-06	0	0	0	0	**WG2**	pH < 10.5
J-G-000073	BA-PV-AF-F2-SMA	**0.75**	0	1.6E-06	0	0	0	0	**WG2**	pH < 10.5
J-G-000079	BA-G-F-F2-SMA	1.28	0	3.4E-07	0	0	0	0	WG1	pH > = 10.5
J-G-000080	BA-G-F-F2-SMA	1.03	**4.2E-04**	6.5E-07	0	0	0	0	**WG2**	pH > = 10.5
J-G-000081	BA-G-F-F2-SMA	1.35	1.8E-05	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-G-000082	BA-G-HB-F2-SMA	**-0.74**	0	0	0	0	0	0	WG1	No init. Cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-G-000087	RA-G-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-000088	RA-G-MX-F2-SMA	1.44	0	8.7E-07	0	0	0	0	WG1	pH > = 10.5
J-G-000089	RA-G-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-000090	BA-G-KB-F2-SMA	1.22	0	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-000091	BA-G-KB-F2-SMA	1.12	5.7E-05	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-000093	BA-G-HB-F2-SMA	**-0.60**	0	0	0	0	0	0	WG1	No init. Cement
J-G-910001	BA-G-HB-F2-SMA	**-0.60**	0	0	0	0	0	0	WG1	No init. Cement
J-G-910002	BA-G-KB-F2-SMA	1.22	0	0	**2.0E-02**	0	0	0	**WG2**	No init. Cement
J-G-910003	BA-G-F-F2-SMA	1.28	0	3.4E-07	0	0	0	0	WG1	pH > = 10.5
J-G-910010	BA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-G-910011	BA-G-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320141	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320142	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320143	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320144	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320151	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320152	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320153	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320161	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320162	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320171	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320181	SA-G-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-G-9320211	SA-G-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320212	SA-G-MS-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-G-9320221	SA-G-ME-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320222	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320223	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320224	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320225	SA-G-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320226	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320231	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320232	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320233	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320234	SA-G-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320301	SA-G-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9320302	SA-G-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321001	SA-G-X-F2-SMA	**-0.64**	0	4.0E-07	0	0	0	0	**WG2**	pH < 10.5
J-G-9321011	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-G-9321014	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-G-9321015	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-G-9321201	SA-G-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321204	SA-G-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321205	SA-G-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321301	SA-G-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321304	SA-G-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321305	SA-G-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-9321310	SA-G-B-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-932200	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-G-932201	SA-G-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-G-932202	SA-G-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-G-932203	SA-G-X-F2-SMA	1.47	0	6.5E-07	0	0	0	0	WG1	pH > = 10.5
J-G-932210	SA-G-H-M2-SMA	1.48	0	0	0	0	0	0	WG1	No init. Cement
J-G-932211	SA-G-H-M2-SMA	1.72	0	0	0	0	0	0	WG1	No init. Cement
J-L-000003	BA-L-X-F2-SMA	**0.84**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-L-000004	BA-L-H-F2-SMA	1.50	0	0	0	0	0	5.6E-03	WG1	pH > = 10.5
J-L-000005	RA-L-MX-F2-SMA	1.89	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000006	RA-L-F-F2-SMA	1.83	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000012	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000015	BA-L-H-F2-SMA	1.50	0	0	0	0	0	1.8E-05	WG1	pH > = 10.5
J-L-000017	BA-L-H-F2-SMA	1.50	0	1.9E-06	0	0	0	5.6E-03	WG1	pH > = 10.5
J-L-000018	BA-L-H-F2-SMA	1.49	0	0	0	0	0	5.6E-03	WG1	pH > = 10.5
J-L-000019	BA-L-H-F2-SMA	1.48	0	1.9E-06	0	0	0	5.6E-03	WG1	pH > = 10.5
J-L-000022	BA-PV-AF-F2-SMA	**1.06**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-L-000023	BA-PV-AF-F2-SMA	**1.00**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-L-000024	BA-PV-AF-F2-SMA	**0.76**	0	1.6E-06	0	0	0	0	**WG2**	pH < 10.5
J-L-000025	BA-PV-AF-F2-SMA	**1.00**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-L-000026	BA-PV-AF-F2-SMA	**0.76**	0	1.6E-06	0	0	0	0	**WG2**	pH < 10.5
J-L-000027	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000028	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-L-000029	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-L-000030	BA-L-X-F2-SMA	1.38	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000033	BA-L-X-F2-SMA	1.13	0	6.4E-07	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-L-000034	BA-L-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000035	BA-L-X-F2-SMA	1.47	0	5.9E-07	0	0	0	0	WG1	pH > = 10.5
J-L-000036	BA-L-X-F2-SMA	1.89	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-000037	BA-L-S-F2-SMA	1.63	**2.4E-04**	0	0	0	0	0	**WG2**	pH > = 10.5
J-L-000038	BA-L-X-F2-SMA	**0.38**	0	3.2E-07	0	0	0	0	**WG2**	pH < 10.5
J-L-000043	BA-L-S-F2-SMA	1.50	0	5.0E-07	0	0	0	**1.2E-01**	**WG2**	pH > = 10.5
J-L-000046	BA-L-H-F2-SMA	1.44	0	1.3E-06	0	0	0	1.4E-02	WG1	pH > = 10.5
J-L-000060	RA-L-MX-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-L-000061	RA-L-MX-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-L-000062	RA-L-MX-F2-SMA	1.44	0	9.5E-07	0	0	0	0	WG1	pH > = 10.5
J-L-000063	RA-L-MX-F2-SMA	1.43	0	5.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-000064	RA-L-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-000065	RA-L-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-000066	RA-L-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-000090	RA-L-F-F2-SMA	1.42	0	8.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-910001	BA-L-H-F2-SMA	1.50	0	1.9E-06	0	0	0	5.6E-03	WG1	pH > = 10.5
J-L-910002	BA-L-S-F2-SMA	1.44	0	1.3E-06	0	0	0	1.4E-02	WG1	pH > = 10.5
J-L-910003	BA-L-F-F2-SMA	1.42	0	8.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-910006	BA-L-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-910008	BA-L-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-910010	BA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9320131	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320132	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320133	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-L-9320134	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320135	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320141	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320142	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320143	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320144	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320145	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320151	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320152	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320153	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320154	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320155	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320161	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320162	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320163	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320164	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320165	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320166	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320171	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320172	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320173	SA-L-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement
J-L-9320211	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320212	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320213	SA-L-MS-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-L-9320221	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320222	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320223	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320224	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320225	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320226	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320227	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320228	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320231	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320232	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320233	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320234	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320235	SA-L-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320301	SA-L-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320302	SA-L-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9320303	SA-L-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321002	SA-L-MS-F2-SMA	1.47	0	6.2E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321003	SA-L-MS-F2-SMA	1.47	0	6.2E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321004	SA-L-MS-F2-SMA	1.47	0	6.2E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321012	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321013	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321014	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-9321022	SA-L-X-F2-SMA	**-0.64**	0	4.0E-07	0	0	0	0	**WG2**	pH < 10.5
J-L-9321024	SA-L-X-F2-SMA	**-0.64**	0	4.0E-07	0	0	0	0	**WG2**	pH < 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-L-9321201	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321202	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321203	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321204	SA-L-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321301	SA-L-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321302	SA-L-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321303	SA-L-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321304	SA-L-MS-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-9321310	SA-L-B-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-932200	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-L-932201	SA-L-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-L-932202	SA-L-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-L-932203	SA-L-X-F2-SMA	1.47	0	6.5E-07	0	0	0	0	WG1	pH > = 10.5
J-L-932210	SA-L-H-M2-SMA	1.48	0	0	0	0	0	0	WG1	No init. Cement
J-L-932211	SA-L-H-M2-SMA	1.72	0	0	0	0	0	0	WG1	No init. Cement
J-M-000049	RA-M-F-F2-SMA	1.32	0	8.5E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000050	RA-M-MX-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000051	RA-M-MX-F2-SMA	1.48	0	5.7E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000054	BA-M-X-F2-SMA	**0.34**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-M-000055	BA-M-X-F2-SMA	**0.51**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-M-000061	BA-M-H-F2-SMA	**0.94**	0	9.5E-07	0	0	0	0	**WG2**	pH > = 10.5
J-M-000064	BA-M-H-F2-SMA	**1.00**	0	9.5E-07	0	0	0	0	**WG2**	pH > = 10.5
J-M-000066	BA-M-H-F2-SMA	**1.00**	0	1.2E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000070	BA-M-H-F2-SMA	**1.00**	1.0E-06	9.5E-07	0	0	0	0	**WG2**	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-M-000071	BA-M-S-F2-SMA	1.46	3.8E-05	2.0E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000072	BA-PV-AF-F2-SMA	**1.05**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-M-000073	BA-PV-AF-F2-SMA	**1.05**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-M-000074	BA-PV-AF-F2-SMA	**1.05**	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-M-000075	BA-PV-AF-F2-SMA	**0.58**	0	1.5E-06	0	0	0	0	**WG2**	pH < 10.5
J-M-000076	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000077	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000078	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000079	BA-PV-AF-F2-SMA	**0.91**	0	1.3E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000080	BA-PV-AF-F2-SMA	**0.91**	0	1.3E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000081	BA-PV-AF-F2-SMA	**0.91**	0	1.3E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000082	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000083	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000084	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000085	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000086	BA-PV-AF-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000087	BA-PV-AF-F2-SMA	**1.01**	0	1.3E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000088	BA-M-H-F2-SMA	**0.96**	0	1.0E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000089	BA-M-H-F2-SMA	**1.01**	0	1.0E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000090	BA-M-H-F2-SMA	**1.00**	0	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000091	BA-M-H-F2-SMA	**1.00**	0	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000092	BA-M-H-F2-SMA	**1.05**	1.0E-06	1.0E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000094	RA-M-MX-F2-SMA	1.44	0	9.3E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000096	RA-M-MX-F2-SMA	1.44	0	9.3E-07	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-M-000097	RA-M-F-F2-SMA	1.37	0	9.4E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000098	RA-M-MX-F2-SMA	1.37	0	9.4E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000099	BA-M-F-F2-SMA	1.32	0	8.5E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000100	RA-M-MX-F2-SMA	1.47	0	6.5E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000102	BA-M-S-F2-SMA	1.30	7.1E-06	1.9E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000103	RA-M-ME-B1-SMA	**-0.75**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-M-000104	BA-M-H-F2-SMA	1.80	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000105A	BA-M-H-F2-SMA	1.43	0	3.1E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000107	BA-M-X-F2-SMA	1.50	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000108	BA-M-X-F2-SMA	1.08	0	1.2E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000109	BA-M-X-F2-SMA	1.50	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000110	BA-M-X-F2-SMA	1.23	0	7.9E-07	0	0	0	0	WG1	pH > = 10.5
J-M-000111	BA-M-X-F2-SMA	1.24	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000112	BA-M-X-F2-SMA	**1.01**	0	6.3E-07	0	0	0	0	**WG2**	pH > = 10.5
J-M-000113	BA-M-X-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-000114	BA-M-X-F2-SMA	1.22	0	1.2E-06	0	0	0	0	WG1	pH > = 10.5
J-M-000116	BA-M-X-F2-SMA	**0.23**	0	3.7E-07	0	0	0	0	**WG2**	pH < 10.5
J-M-000119	BA-M-H-F2-SMA	**1.04**	1.0E-06	2.0E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-000122	RA-M-ME-B1-SMA	**-0.73**	0	1.8E-07	0	0	0	0	**WG2**	pH < 10.5
J-M-910001	BA-M-H-F2-SMA	**1.01**	0	1.0E-06	0	0	0	0	**WG2**	pH > = 10.5
J-M-910002	BA-M-S-F2-SMA	1.30	7.1E-06	1.9E-06	0	0	0	0	WG1	pH > = 10.5
J-M-910003	BA-M-F-F2-SMA	1.32	0	8.5E-07	0	0	0	0	WG1	pH > = 10.5
J-M-910010	BA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-M-920001	RA-M-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. Cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-M-920002	RA-M-MX-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320001	SA-M-ME-F2-SMA	1.90	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320002	SA-M-ME-F2-SMA	1.44	0	9.8E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320003	SA-M-ME-F2-SMA	1.44	0	9.0E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320004	SA-M-ME-F2-SMA	1.43	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-M-9320005	SA-M-ME-F2-SMA	1.43	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-M-9320006	SA-M-ME-F2-SMA	1.44	0	9.9E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320007	SA-M-ME-F2-SMA	1.43	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-M-9320008	SA-M-ME-F2-SMA	1.44	0	9.1E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320009	SA-M-ME-F2-SMA	1.44	0	9.8E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320010	SA-M-ME-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320011	SA-M-ME-F2-SMA	1.44	0	9.2E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320012	SA-M-ME-F2-SMA	1.44	0	9.0E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9320131	SA-M-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-M-9320132	SA-M-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-M-9320133	SA-M-ME-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-M-9320211	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320212	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320221	SA-M-ME-L3-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320222	SA-M-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320223	SA-M-ME-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320224	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320225	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9320301	SA-M-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-M-9320302	SA-M-MS-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321011	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-M-9321201	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321202	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321203	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321204	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321205	SA-M-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-9321311	SA-M-X-L4-SMA	**-8.42**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-M-9321320	SA-M-B-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-932200	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-M-932201	SA-M-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-M-932202	SA-M-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-M-932203	SA-M-X-F2-SMA	1.47	0	6.5E-07	0	0	0	0	WG1	pH > = 10.5
J-N-900001	BA-OH-F-F2-SMA	1.48	0	5.8E-07	0	0	0	0	WG1	pH > = 10.5
J-N-900003	BA-OH-X-F2-SMA	1.38	0	2.4E-06	0	0	0	0	WG1	pH > = 10.5
J-N-900004	BA-OH-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-N-900005	BA-OH-ME-F2-SMA	1.45	0	8.6E-07	0	0	0	0	WG1	pH > = 10.5
J-N-900501B	SA-OH-B-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-N-900503	SA-OH-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-N-900504	SA-OH-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-N-900505	SA-OH-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5
J-N-910001	BA-TB-MS-F2-SMA	1.47	0	6.8E-07	0	0	0	0	WG1	pH > = 10.5
J-N-910002	BA-TB-MS-F2-SMA	1.44	0	9.6E-07	0	0	0	0	WG1	pH > = 10.5
J-N-910004	BA-TB-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-N-910005	BA-TB-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-N-910007	BA-TB-ME-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-N-920001	BA-OS-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-P-000164	SA-PD-X-F2-SMA	1.42	0	9.4E-07	0	0	0	0	WG1	pH > = 10.5
J-P-000164B	SA-PD-X-F2-SMA	1.42	0	9.4E-07	0	0	0	0	WG1	pH > = 10.5
J-P-000179	BA-PH-PF-F2-ATA	1.20	**1.9E-04**	6.4E-07	0	0	0	**5.3E-02**	**WG2**	pH > = 10.5
J-P-000179B	BA-PH-PF-F2-ATA	1.20	**1.9E-04**	6.4E-07	0	0	0	**5.3E-02**	**WG2**	pH > = 10.5
J-P-001001	BA-P-S-F2-SMA	1.75	0	1.3E-06	0	0	0	**4.8E-01**	**WG2**	pH > = 10.5
J-P-001003	BA-P-S-F2-SMA	1.41	**2.6E-04**	4.2E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-001004	BA-P-S-F2-SMA	1.64	**1.9E-04**	0	0	0	0	0	**WG2**	pH > = 10.5
J-P-001005	BA-P-S-F2-SMA	1.72	0	4.2E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001006	BA-P-S-F2-SMA	1.66	0	4.2E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001007	BA-P-S-F2-SMA	1.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001008	BA-P-S-F2-SMA	1.50	0	5.3E-07	0	0	0	**1.2E-01**	**WG2**	pH > = 10.5
J-P-001009	BA-P-S-F2-SMA	1.50	0	5.3E-07	0	0	0	**1.2E-01**	**WG2**	pH > = 10.5
J-P-001020	BA-P-X-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001021	BA-P-X-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001022	BA-P-X-F2-SMA	1.65	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001023	BA-P-X-F2-SMA	1.29	0	9.9E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001030	BA-P-X-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001031	BA-P-X-F2-SMA	1.64	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001032	BA-P-X-F2-SMA	1.47	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001033	BA-P-X-F2-SMA	1.89	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001034	BA-P-X-F2-SMA	**1.05**	0	9.5E-07	0	0	0	0	**WG2**	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-001035	BA-P-X-F2-SMA	1.49	0	8.4E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001050	BA-PV-AF-F2-SMA	1.39	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001052	BA-PV-AF-F2-SMA	**0.99**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-001054	BA-PV-AF-F2-SMA	**0.99**	0	1.4E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-001055	BA-PV-AF-F2-SMA	**0.71**	0	1.6E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-001080	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001081	BA-PV-AF-F2-SMA	1.61	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001082	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001083	BA-PV-AF-F2-SMA	1.73	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001084	BA-PV-AF-F2-SMA	1.17	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001100	BA-P-X-F2-SMA	1.04	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-P-001101	BA-P-X-F2-SMA	1.04	0	0	0	0	0	0	**WG2**	pH > = 10.5
J-P-001102	BA-P-X-F2-SMA	**0.86**	0	5.4E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-001103	BA-P-X-F2-SMA	**1.04**	0	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-001110	BA-PB-X-F2-SMA	1.76	1.9E-05	0	0	0	0	0	WG1	pH > = 10.5
J-P-001111	BA-PB-X-F2-SMA	1.76	1.9E-05	0	0	0	0	0	WG1	pH > = 10.5
J-P-001112	BA-PB-X-F2-SMA	1.76	1.9E-05	0	0	0	0	0	WG1	pH > = 10.5
J-P-001113	BA-PB-X-F2-SMA	1.25	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001114S	BA-PB-X-F2-SMA	1.31	2.8E-05	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001114T	BA-PB-X-F2-ATA	1.31	2.8E-05	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001115	BA-PB-X-F2-SMA	**1.06**	8.4E-05	8.6E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-001116S	BA-PB-X-F2-SMA	1.16	5.5E-05	8.6E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001116T	BA-PB-X-F2-ATA	1.16	5.5E-05	8.6E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001117S	BA-PB-X-F2-SMA	1.31	2.8E-05	1.0E-06	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-001117T	BA-PB-X-F2-ATA	1.31	2.8E-05	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001118	BA-PB-X-F2-SMA	1.52	0	2.6E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001120	BA-P-X-F2-SMA	1.85	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001121	BA-P-X-F2-SMA	1.85	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001122	BA-P-X-F2-SMA	1.85	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001123	BA-P-X-F2-SMA	1.43	0	8.8E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001124	BA-P-X-B1-SMA	**-0.71**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001125	BA-P-X-F2-SMA	1.44	0	8.4E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001201	BA-PB-X-B1-ATA	**-0.83**	1.6E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001202	BA-PB-X-F2-ATA	1.49	8.4E-05	0	0	0	0	0	WG1	pH > = 10.5
J-P-001203	BA-PB-X-F2-ATA	1.49	8.4E-05	0	0	0	0	0	WG1	pH > = 10.5
J-P-001204	BA-PB-X-F2-ATA	1.27	8.4E-05	4.9E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001211	BA-PB-X-B1-SMA	**-0.84**	2.4E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001212	BA-PB-X-F2-SMA	1.38	**1.3E-04**	0	0	0	0	0	**WG2**	pH > = 10.5
J-P-001213	BA-PB-X-F2-SMA	1.38	**1.3E-04**	0	0	0	0	0	**WG2**	pH > = 10.5
J-P-001214	BA-PB-X-F2-SMA	1.18	**1.3E-04**	4.9E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-001230	BA-PB-X-Z6-SMA	2.86	0	0	0	0	0	0	WG1	No init. cement
J-P-001231S	BA-PB-X-Z4-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-P-001231T	BA-PB-X-Z4-ATA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-P-001232	BA-PB-X-Z4-ATA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-P-001240	BA-PB-X-Z6-SMA	1.84	**8.6E-04**	0	0	0	0	0	**WG2**	No init. cement
J-P-001241	BA-PB-X-Z6-SMA	**-2.77**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001242	BA-PB-X-Z5-SMA	2.76	0	0	0	0	0	0	WG1	No init. cement
J-P-001243	BA-PB-X-Z6-SMA	2.85	0	0	0	0	0	0	WG1	No init. cement

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-001244	BA-PB-X-Z7-SMA	**0.70**	**7.7E-04**	0	0	0	0	0	**WG2**	No init. cement
J-P-001245	BA-PB-X-Z7-SMA	2.26	0	0	0	0	0	0	WG1	No init. cement
J-P-001250	BA-PB-X-Z6-SMA	**-1.70**	6.8E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001251	BA-PB-X-Z6-SMA	**-1.65**	1.6E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001252	BA-PB-X-Z6-SMA	**-1.27**	4.1E-06	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001253	BA-PB-X-Z6-SMA	**-1.92**	7.8E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001254	BA-PB-X-Z6-SMA	**-1.09**	3.6E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001255	BA-PB-X-Z6-ATA	**-1.50**	2.3E-06	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001256	BA-PB-X-Z5-ATA	**-1.35**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001257	BA-PB-X-Z6-SMA	**-1.30**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001258	BA-PB-X-Z5-SMA	**0.23**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001259	BA-PB-X-Z6-SMA	**-0.76**	4.2E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001260	BA-PB-X-Z6-SMA	**-2.12**	6.1E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001261	BA-PB-X-Z6-SMA	**-2.12**	1.3E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001262	BA-PB-X-Z6-SMA	**-2.15**	8.8E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001263	BA-PB-X-Z6-SMA	**-1.96**	3.6E-05	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001264	BA-PB-X-Z6-SMA	**-1.74**	1.6E-06	0	0	0	0	0	**WG2**	pH < 10.5
J-P-001300S	BA-P-U-F2-SMA	1.41	0	1.1E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001300T	BA-P-U-F2-ATA	1.41	0	1.1E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001305S	BA-P-U-F2-SMA	1.41	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001305T	BA-P-U-F2-ATA	1.41	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-001400	BA-PB-X-Z2-ATA	1.53	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-001401	BA-PB-X-Z2-ATA	1.20	0	7.3E-07	0	0	0	0	WG1	pH > = 10.5
J-P-001600	BA-P-X-F2-SMA	1.47	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-002010S	BA-PH-PF-F2-SMA	1.40	**1.9E-04**	0	0	0	0	**5.4E-02**	**WG2**	pH > = 10.5
J-P-002010T	BA-PH-PF-F2-ATA	1.40	**1.9E-04**	0	0	0	0	**5.4E-02**	**WG2**	pH > = 10.5
J-P-002011S	BA-PH-PF-F2-SMA	1.15	**1.8E-04**	6.4E-07	0	0	0	**5.1E-02**	**WG2**	pH > = 10.5
J-P-002011T	BA-PH-PF-F2-ATA	1.15	**1.8E-04**	6.4E-07	0	0	0	**5.1E-02**	**WG2**	pH > = 10.5
J-P-002012S	BA-PH-PF-F2-SMA	1.16	**1.8E-04**	6.4E-07	0	0	0	**5.2E-02**	**WG2**	pH > = 10.5
J-P-002012T	BA-PH-PF-F2-ATA	1.16	**1.8E-04**	6.4E-07	0	0	0	**5.2E-02**	**WG2**	pH > = 10.5
J-P-002013	BA-PH-PF-F2-ATA	1.20	5.3E-05	1.0E-06	0	0	0	1.6E-02	WG1	pH > = 10.5
J-P-002020	BA-PH-PF-B1-SMA	**-0.70**	2.0E-06	0	0	0	0	0	**WG2**	pH < 10.5
J-P-002021	BA-PH-PF-F2-ATA	1.82	9.8E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-002021B	BA-PH-PF-F2-ATA	1.82	9.8E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-002028	BA-PH-PF-Z9A-ATA	**-2.25**	**1.6E-04**	1.9E-07	0	0	0	0	**WG2**	pH < 10.5
J-P-002030	BA-PH-PF-F2-SMA	1.28	8.2E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-002031	BA-PH-PF-F2-SMA	1.19	1.0E-05	8.8E-07	0	0	0	0	WG1	pH > = 10.5
J-P-002032	BA-PH-PF-F2-SMA	**1.08**	8.2E-06	8.7E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-002033	BA-PH-PF-F2-SMA	**0.95**	0	8.2E-07	0	0	0	0	**WG2**	pH > = 10.5
J-P-002034	BA-PH-PF-B1-SMA	**-0.86**	1.7E-06	0	0	0	0	0	**WG2**	pH < 10.5
J-P-002035	BA-PH-PF-F2-SMA	1.42	0	1.1E-06	0	0	0	0	WG1	pH > = 10.5
J-P-002040	BA-PH-PF-F2-SMA	1.56	0	6.0E-07	0	0	0	0	WG1	pH > = 10.5
J-P-002041	BA-PH-PF-F2-SMA	1.56	0	6.0E-07	0	0	0	0	WG1	pH > = 10.5
J-P-002042	BA-PH-PF-F2-SMA	1.49	0	9.0E-07	0	0	0	0	WG1	pH > = 10.5
J-P-002045	BA-PH-PL-B2-ATA	**0.00**	0	1.1E-06	0	0	0	**5.3E-02**	**WG2**	pH < 10.5
J-P-002046	BA-PH-PL-Z8-ATA	**-1.32**	0	1.1E-06	0	0	0	2.0E-01	**WG2**	pH < 10.5
J-P-002054	BA-PH-PL-F2-SMA	1.91	0	0	0	0	0	4.8E-02	WG1	pH > = 10.5
J-P-002060	BA-PH-PF-F2-SMA	**0.55**	**3.0E-04**	0	0	0	0	0	**WG2**	pH < 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-002061	BA-PH-PF-F2-SMA	**0.45**	**3.0E-04**	4.9E-07	0	0	0	0	**WG2**	pH < 10.5
J-P-002062S	BA-PH-PF-F2-SMA	**0.45**	**3.0E-04**	4.9E-07	0	0	0	0	**WG2**	pH < 10.5
J-P-002062T	BA-PH-PF-F2-ATA	**0.45**	**3.0E-04**	4.9E-07	0	0	0	0	**WG2**	pH < 10.5
J-P-002063	BA-PH-PF-F2-SMA	**0.88**	8.7E-05	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-002064	BA-PH-PF-F2-ATA	**0.88**	8.7E-05	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-002070	BA-PH-PF-F2-SMA	1.86	2.3E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-002080	BA-PH-PF-F2-SMA	1.76	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-002081	BA-PH-PF-F2-SMA	1.38	0	1.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-002100	BA-PH-SF-F2-ATA	1.16	0	8.8E-07	0	0	0	7.1E-03	WG1	pH > = 10.5
J-P-002600	BA-PH-X-F2-SMA	1.38	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-P-003000	SA-PD-MA-C1-SMA	**-0.03**	0	1.7E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-003010	SA-PD-MA-C1-SMA	**-0.58**	0	1.5E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-003100	SA-PD-X-C1-SMA	**-0.66**	0	2.1E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-004000A	SA-PS-MX-M2-SMA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-P-004010	SA-PS-X-C1-SMA	**-0.59**	0	2.1E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-005000	BA-P-X-C1-SMA	1.65	0	1.9E-06	0	0	0	0	WG1	pH > = 10.5
J-P-005100	SA-PV-X-C1-SMA	1.67	0	3.1E-06	0	0	0	0	WG1	pH > = 10.5
J-P-005110	SA-PP-X-C1-SMA	1.26	0	2.0E-06	0	0	0	0	WG1	pH > = 10.5
J-P-005200	BA-P-MA-C1-SMA	**-0.54**	0	1.7E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-005300	SA-P-X-F2-SMA	1.11	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010001	SA-PW-MX-C3-SMA	1.99	0	1.2E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010003	BA-PW-X-C1-SMA	2.79	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-010004	BA-PW-X-C1-SMA	2.83	0	0	0	0	0	0	WG1	pH > = 10.5
J-P-010005	BA-PW-X-C2-SMA	2.85	0	0	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-010008	BA-PW-X-C1-SMA	1.64	0	2.6E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010010	BA-PW-X-C1-SMA	2.25	0	9.5E-07	0	0	0	0	WG1	pH > = 10.5
J-P-010013S	BA-PW-MX-C1-SMA	1.58	0	2.5E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010013T	BA-PW-MX-C1-ATA	1.58	0	2.5E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010020	BA-PW-MX-C1-ATA	1.70	0	1.9E-06	0	0	0	0	WG1	pH > = 10.5
J-P-010021	BA-PW-MX-C1-ATA	1.27	5.1E-06	3.1E-06	0	0	0	0	WG1	pH > = 10.5
J-P-012000	BA-C-MX-C1-SMA	1.50	0	4.6E-06	0	0	0	0	WG1	pH > = 10.5
J-P-920001	BA-C-MX-C1-SMA	1.50	0	4.6E-06	0	0	0	0	WG1	pH > = 10.5
J-P-920002	BA-C-X-F2-SMA	**1.04**	0	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-920003	BA-C-X-F2-SMA	**1.04**	0	1.1E-06	0	0	0	0	**WG2**	pH > = 10.5
J-P-960201	SA-PH-PF-F2-SMA	1.82	9.8E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-960202	SA-PH-PF-F2-SMA	1.82	9.8E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-960203	SA-PH-PF-F2-SMA	1.82	9.8E-06	0	0	0	0	0	WG1	pH > = 10.5
J-P-960211	SA-PH-PF-F2-SMA	**0.45**	**3.0E-04**	4.9E-07	0	0	0	0	**WG2**	pH < 10.5
J-P-960221	SA-PH-PF-F2-SMA	1.56	0	6.0E-07	0	0	0	0	WG1	pH > = 10.5
J-P-970001	SA-PW-B-C1-SMA	2.05	0	3.2E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970011	SA-PW-MC-C1-SMA	1.67	0	3.7E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970101	SA-PW-ME-C1-SMA	2.84	0	2.5E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970111	SA-PW-ME-C1-SMA	1.75	0	2.9E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970200	SA-PW-MA-C1-SMA	**-0.07**	0	4.2E-06	0	0	0	0	**WG2**	pH < 10.5
J-P-970301	SA-PW-MS-C1-SMA	2.84	0	2.5E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970311	SA-PW-MS-C1-SMA	1.75	0	2.8E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970400	SA-PW-MX-C1-SMA	1.80	0	2.4E-06	0	0	0	0	WG1	pH > = 10.5
J-P-970500	SA-PW-X-C1-SMA	1.46	0	4.6E-06	0	0	0	0	WG1	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-P-970601	SA-PW-MX-C1-SMA	2.88	0	7.4E-07	0	0	0	0	WG1	pH > = 10.5
J-P-970611	SA-PW-MX-C1-SMA	2.47	0	9.0E-07	0	0	0	0	WG1	pH > = 10.5
J-P-970711	SA-PW-B-C1-SMA	2.49	0	8.7E-07	0	0	0	0	WG1	pH > = 10.5
J-P-980001	SA-P-B-C1-SMA	1.67	0	1.7E-06	0	0	0	0	WG1	pH > = 10.5
J-P-980002	SA-P-MX-C1-SMA	1.25	0	2.8E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-000104	BA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-Z-000301	BA-Z-X-C1-SMA	1.67	0	3.9E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-000402	SA-LU-B-F2-SMA	1.75	0	9.4E-07	0	0	0	0	WG1	pH > = 10.5
J-Z-000403	BA-Z-B-C1-SMA	1.60	0	5.1E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-000404	BA-Z-PA-C1-SMA	2.85	0	3.6E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-000501	BA-Z-X-C1-SMA	1.97	2.3E-05	3.9E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-000901	SA-LU-MX-B1-SMA	**-0.60**	0	0	0	0	0	0	**WG2**	pH < 10.5
J-Z-003000	WA-F-MX-K2-ATA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-Z-003003	WA-F-SG-K2-ATA	2.90	0	0	0	0	0	0	WG1	No init. cement
J-Z-900004	BA-Z-X-L3-SMA	1.84	0	1.4E-06	0	0	0	0	WG1	pH > = 10.5
J-Z-932100	SA-Z-MS-F2-SMA	1.47	0	6.2E-07	0	0	0	0	WG1	pH > = 10.5
J-Z-932101	SA-Z-X-F2-SMA	1.50	0	4.0E-07	0	0	0	0	WG1	pH > = 10.5
J-Z-932102	SA-Z-X-F2-SMA	**-0.64**	0	4.0E-07	0	0	0	0	**WG2**	pH < 10.5
J-Z-932120	SA-Z-MS-L3-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-Z-932130	SA-Z-B-L4-SMA	2.86	0	0	0	0	0	0	WG1	pH > = 10.5
J-Z-932133	SA-Z-B-L4-SMA	2.87	0	0	0	0	0	0	WG1	pH > = 10.5
J-Z-932200	SA-Z-PA-F2-SMA	1.53	0	2.3E-07	0	0	0	0	WG1	pH > = 10.5
J-Z-932201	SA-Z-X-F2-SMA	1.72	0	0	0	0	0	0	WG1	pH > = 10.5
J-Z-932202	SA-Z-K-F2-SMA	1.30	0	1.5E-07	0	**5.7E-02**	**1.0E-02**	0	**WG2**	pH > = 10.5

Waste type	Waste sort	Sorption criteria	Cellulose-like materials	Gluconic acid	EDTA	NTA	Cyanide	Nitrate + Nitrite	Waste group	pH criteria
J-Z-970001B	SA-LU-MX-L3-ATA	2.80	0	0	0	0	0	0	WG1	pH > = 10.5
J-Z-970002B	SA-LU-MX-L3-SMA	2.81	0	0	0	0	0	0	WG1	pH > = 10.5