

SUPPLEMENTAL INFORMATION

Determination of Applicability

Hermosa Project Cemented Paste Tailings Backfill

Prepared for:
South32 Hermosa Inc.
1860 E. River Road, Suite 200
Tucson, Arizona 85718

Prepared by



a Geo-Logic Company

221 N. Court Avenue, Suite 101
Tucson, Arizona 85701
clearcreekassociates.com
Project number CC22.1148.00

September 18, 2023



**AQUIFER PROTECTION PERMIT
DETERMINATION OF
APPLICABILITY (DOA)**

GENERAL INFORMATION

1 Applicant – Person signing the application [A.A.C. R18-9-106.B.2]
 (Check One) Owner Operator **Owner and Operator**
 Email brent.musslewhite@outh32.net
 Name Brent Musslewhite, South32 Hermosa Inc. Phone 520-485-1300
 Title Director—Environment and Permitting Business _____
 Mailing Address 1860 E. River Road City Tucson State AZ Zip 85718

2 Facility Name [A.A.C. R18-9-106.B.1]


Facility Name Hermosa Project - Cement Paste Tailings Backfill
 New **Currently Operating**

3 Facility Address and Location Information [A.A.C. R18-9-106.B.1]

Address 749 Harshaw Road
 City Patagonia State AZ Zip _____
 County Santa Cruz
 Township 23S Range 16E Section 5 and 6 Qtr1 _____ Qtr2 _____ Qtr3 _____
 Latitude 31° 27' 59.4" N Longitude 110° 43' 35.8" W NAD27 NAD83

4 Certification Statement [A.A.C. R18-9-A201(B)(7)]

I certify under penalty of law that this Aquifer Protection Permit application and all attachments were prepared under my direction or authorization and all information is, to the best of my knowledge, true, accurate and complete. I also certify that the APP discharging facilities described in this form is or will be designed, constructed, operated, and/or closed in accordance with the terms and conditions the Aquifer Protection Permit and applicable requirements of Arizona Revised Statutes Title 49, Chapter 2, and Arizona Administrative Code Title 18, Chapter 9 regarding aquifer protection permits. I am aware that there are significant penalties for submitting false information, including permit revocation as well as the possibility of fine and imprisonment for knowing violations.

Print Name Brent Musslewhite _____
 _____
 Signature _____ Date 9/18/2023

Pursuant to A.R.S. § 41-1030:

- (1) ADEQ shall not base a licensing decision, in whole or in part, on a requirement or condition not specifically authorized by statute or rule. General authority in a statute does not authorize a requirement or condition unless a rule is made pursuant to it that specifically authorizes the requirement or condition.
- (2) Prohibited licensing decisions may be challenged in a private civil action. Relief may be awarded to the prevailing party against ADEQ, including reasonable attorney fees, damages, and all fees associated with the license application.
- (3) ADEQ employees may not intentionally or knowingly violate the requirement for specific licensing authority. Violation is cause for disciplinary action or dismissal, pursuant to ADEQ's adopted personnel policy. ADEQ employees are still afforded the immunity in A.R.S. §§ 12-821.01 and 12-820.02.

Table of Contents

1.	Introduction.....	1
2.	Hermosa Project Permits and Authorizations.....	2
3.	Background--Cemented Paste Tailings.....	3
4.	Materials Characterization.....	4
4.1	Methodology.....	4
4.2	Inertness Evaluation.....	5
4.2.1	Diffusion Testing.....	6
4.2.2	Acid Generation.....	8
5.	Conclusions.....	10
6.	References.....	11

Tables

1	EPA Method 1315 Diffusion Testing Results
2	Acid Base Accounting Analyses – Raw Tailings

1. Introduction

Clear Creek Associates, LLC prepared this Determination of Applicability (DOA) application and supplemental information on behalf of South32 Hermosa Inc. (South32), a mineral exploration and development company focused on the exploration and potential development of the Hermosa Project (a zinc, silver, manganese, and lead prospect) south of Patagonia, Arizona, in Santa Cruz County.

Exploration at Hermosa is ongoing, and the advancement of shafts and/or declines will facilitate further characterization of the resource. If South32 determines that the development of a mine is feasible and makes a subsequent decision to mine, South32 will proceed with the construction and operation of an underground mine and associated surface facilities.

South32 plans to place approximately 50% of the tailings generated from the project into the underground workings for use as structural fill; the remainder of the tailings will be placed in a permitted, lined dry-stack tailings storage facility that will be permitted to receive such materials through a future amendment to its Aquifer Protection Permit.

According to Arizona Revised Statutes (A.R.S.) § 49-241.B, unless exempted under A.R.S. § 49-250, “facilities that add a pollutant to a salt dome formation, salt bed formation, dry well or underground cave or mine” are considered “categorical” APP facilities. A.R.S. § 49-250.B.20 exempts “Storage, treatment or disposal of inert material” from APP regulations.

By submitting this application, South32 is seeking a decision from the Arizona Department of Environmental Quality regarding the inertness of cemented paste tailings backfill (CPTB) under APP regulations. This request encompasses approximately 34,460,100 cubic meters or 72 million metric tonnes (at 2.09 metric tonnes per cubic meter).

As of the date of this DOA application, South32 has yet to begin mining, and no CPTB has been placed in underground workings.

2. Hermosa Project Permits and Authorizations

South32 currently has the following environmental permits/authorizations:

- Mining Multi-Sector General Permit Authorization AZMS-81380.
- Arizona State Mine Inspector State ID# 13-03295.
- ADEQ Voluntary Remediation Program Site Code #505143-02.
- APP No. P-512235. The current APP-permitted facilities include a dry stack tailings storage facility (TSF), an underdrain collection pond (UCP), and discharge from two water treatment plants (WTP1 and WTP2).
- AZPDES Permit no. AZ0026387.

3. Background--Cemented Paste Tailings

The proposed facility for which this DOA was prepared is the CPTB in the underground workings, which will serve as structural support of the workings and provide a safe environment for miners. CPTB will be mixed in one or more paste plants on the surface at the site. The plants, which are still in the design stage, will be made up of mixing and storage tanks, pumps, and pipelines. The plant components will be exempt and/or designed and operated not to discharge.

CPTB is a mixture of thickened and filtered tailings, water, and a cement binder. The paste is considered "non-draining"; water is not released from the material after it is placed in the dewatered underground workings (Grice et al. 2009). CPTB typically contains between 70 - 85% solids by weight. The proportion of Portland cement in CPTB is dictated by the compressive strength necessary for the material to support the underground workings. Generally, the cement percentage ranges from 2 - 7% by total weight, though proportions up to 10% have been used to increase strength during the early curing phase (Fall and Pokharel, 2020). CPTB must always meet the minimum strength requirements needed to provide structural support with an adequate factor of safety. South32's formula for producing CPTB is expected to include approximately 6.5% cement, but it may vary slightly from location to location depending on geotechnical parameters and flow distances.

During mining, when the workings are actively dewatered, the CPTB will not drain or discharge. After mining and dewatering cease, groundwater will flow into the workings, coming into contact with the CPTB. At that time, diffusion of constituents from CPTB may occur. The materials characterization described below was conducted to evaluate if diffusion will occur at concentrations that exceed Aquifer Water Quality Standards (AWQSs).

4. Materials Characterization

4.1 Methodology

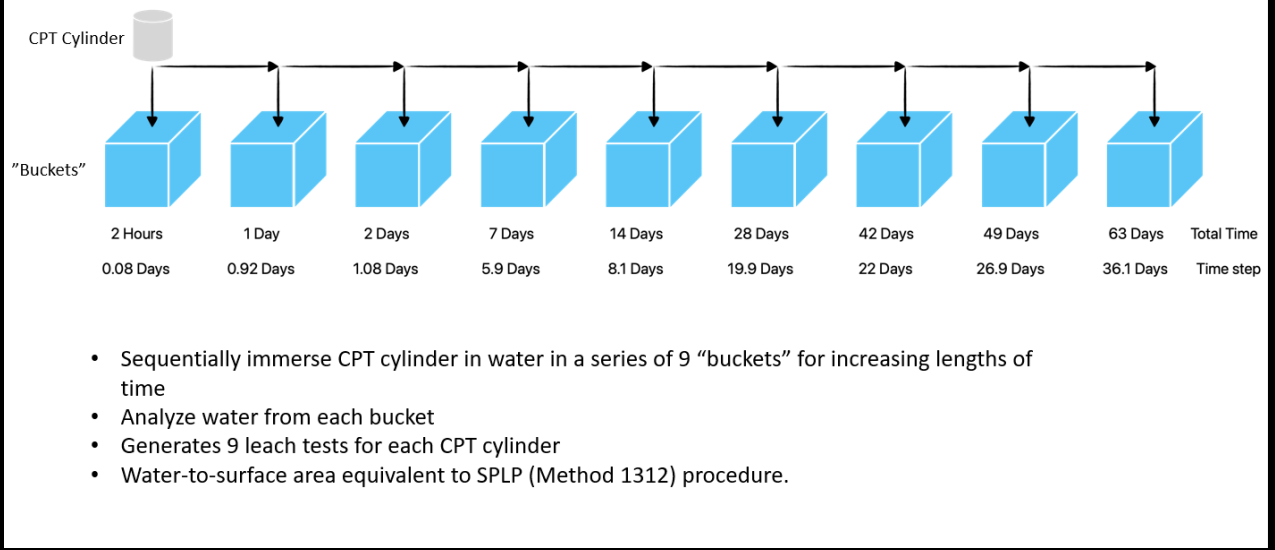
South32 produced tailings from the different lithologic units at the site for metallurgical studies. The tailings were used to produce twenty-eight (28) CPTB cylinders for geotechnical strength testing and materials characterization. The cylinders are approximately 3 inches in diameter and 6 inches long. After preparation, the cylinders were allowed to cure for a minimum of 30 days before geochemical characterization. The cylinders were shipped to ACZ Laboratories for analysis.

The CPTB cylinders were characterized using the Leaching Environmental Assessment Framework (LEAF, Kossen et al. 2002). This testing framework has been adopted in the EU and North America to evaluate CPTB because it accounts for the unique geochemical nature of cement and other monolithic materials in which diffusion limits the release rate of constituents. Conventional static and kinetic test methods (such as SPLP testing and acid-base accounting that are used for conventional or dry-stack tailings that are not cemented) fail to “properly characterize the nature of water-rock interaction” with CPTB (Shafer, 2016). SPLP testing, in particular, is intended to simulate how precipitation leaching through a material above a vadose zone will mobilize constituents. It is not intended to simulate monolithic material submerged in groundwater. Additionally, conventional testing generally requires the crushing of samples, whereas the LEAF protocol uses an intact, cemented specimen. Shafer (2016) demonstrated the LEAF method provided more representative results for evaluating long-term behavior and impacts to groundwater from CPTB due to the low permeability of cemented tailings.

According to Shafer (2016), “LEAF consists of three primary testing protocols to assess solubility across a range of pH levels (EPA Method 1313), chemical release by batch or column leaching (EPA Method 1314 and EPA Method 1316, respectively), and diffusive release (EPA Method 1315).” For the purposes of Hermosa CPTB, EPA Method 1315, was employed as the most appropriate method. According to Kossen et al. (2014), “This method is designed to provide the mass transfer rates (release rates) of inorganic analytes contained in a monolithic or compacted granular material, under diffusion-controlled release conditions, as a function of leaching time.”

The EPA Method 1315 test consists of soaking each cylinder in a series of nine (9) vessels containing distilled water for increasing lengths of time, as shown in Figure 1 below. For each cylinder, there are 9 separate analyses, which may be viewed as 9 individual tests.

Figure 1:
Method 1315



At the completion of the specified time for each step, the cylinder is transferred to the next reaction vessel. After the removal of the cylinder, the solution is analyzed for a suite of chemical constituents.

Standard acid-base accounting analyses were performed on the uncemented, raw tailings used to prepare each cylinder. These analyses were conducted to evaluate the potential for that material to generate acid prior to addition of the cement binder. The binder will contribute substantial alkalinity for buffering potential effects from sulfide mineral oxidation. Therefore the NNPs resulting from these analyses should be considered lower than the NNPs of the CPTB.

4.2 Inertness Evaluation

A.R.S. § 49-201.22 states:

“Inert material means broken concrete, asphaltic pavement, manufactured asbestos-containing products, brick, rock, gravel, sand and soil. Inert material also includes material that when subjected to a water leach test that is designed to approximately natural infiltrating waters will not leach substances in concentrations that exceed numeric aquifer water quality standards established pursuant to section 49-223, including overburden and wall rock that is not acid generating, taking into consideration acid neutralization potential, and that has not and will not be subject to mine leaching operations.”

4.2.1 Diffusion Testing

Results of EPA 1315 diffusion testing are provided in Table 1. Each cylinder was analyzed 9 times, representing the successively increasing soaking times. Measurements of constituents having AWQSs were generally below the respective AWQSs. In Table 1, all analyses that exceed the AWQS value are highlighted in red. Analyses either below the method reporting limit or the analytical method detection appear in blue typeface. Other than antimony, only twenty-four (24) of 2893 measurements are reported as greater than AWQS values. Although not currently assigned a numeric AWQS, measurements for uranium (which did not exceed .03 mg/l, the maximum contaminant level for uranium, in any analysis and were essentially below detection limits) are also shown in Table 1. Arsenic was below the current AWQS of 0.050 mg/l in all analyses; moreover, only three of the 263 arsenic analyses exceeded the 0.010 mg/l maximum contaminant level for arsenic.

Antimony exceeded the AWQS of 0.006 mg/L in 117 of the 263 total analyses. However, the geometric mean of all analyses was below the AWQS (Table 1). The geometric mean was used for this calculation as the concentration data were asymmetrically (log normally) distributed (Figure 2). The arithmetic average of the later time tests (days 14 - 63) for each cylinder was also calculated. This concentration represents the long-term equilibrium concentration between the cylinder and water. The arithmetic average was used because the late time data for each cylinder had a normal distribution. The geometric mean of those arithmetic averages for late time data was calculated to be below the AWQS for antimony of 0.006 mg/L. The geometric mean is appropriate for this calculation because the 14-63 day averages were log-normally distributed. (Figure 3).

The 14-63 day portion of the tests, where concentrations are generally consistent, represents a limit on chemical loading for the CPTB and provides a useful assessment and basis for considering the CPTB chemically inert. This leveling out of constituent concentrations in the EPA Method 1315 tests for antimony provides insight into how diffusion *rates* decline over time. With a primary release mechanism driven by chemical diffusion, higher concentrations *within* the test cylinders diffuse toward lower concentration in the contacting water. In this example, antimony moves out of the cylinder into the water until the concentrations equilibrate. At that point there is no longer a driving force for diffusion.

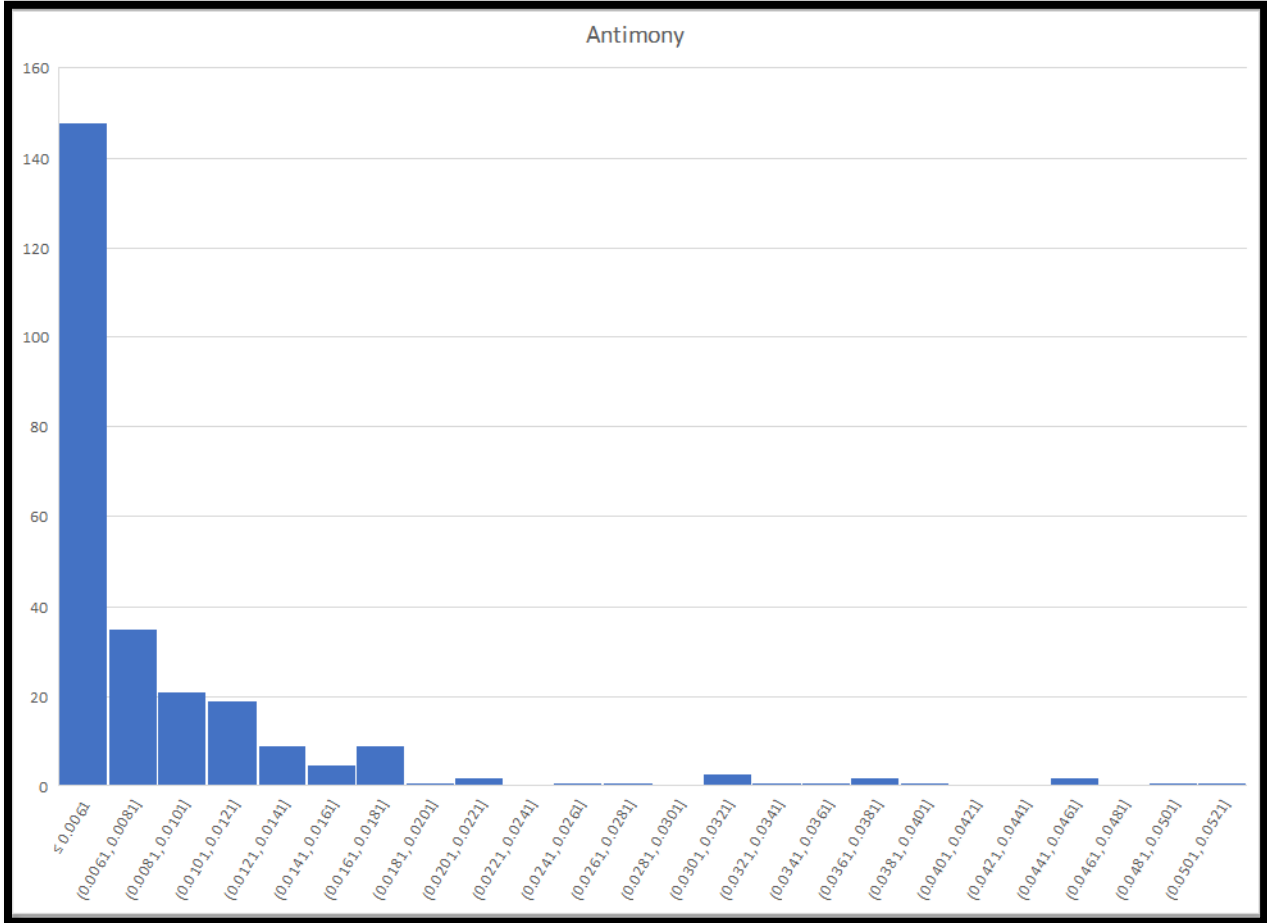


Figure 2: Antimony concentrations in all individual EPA Method 1315 reaction vessels.

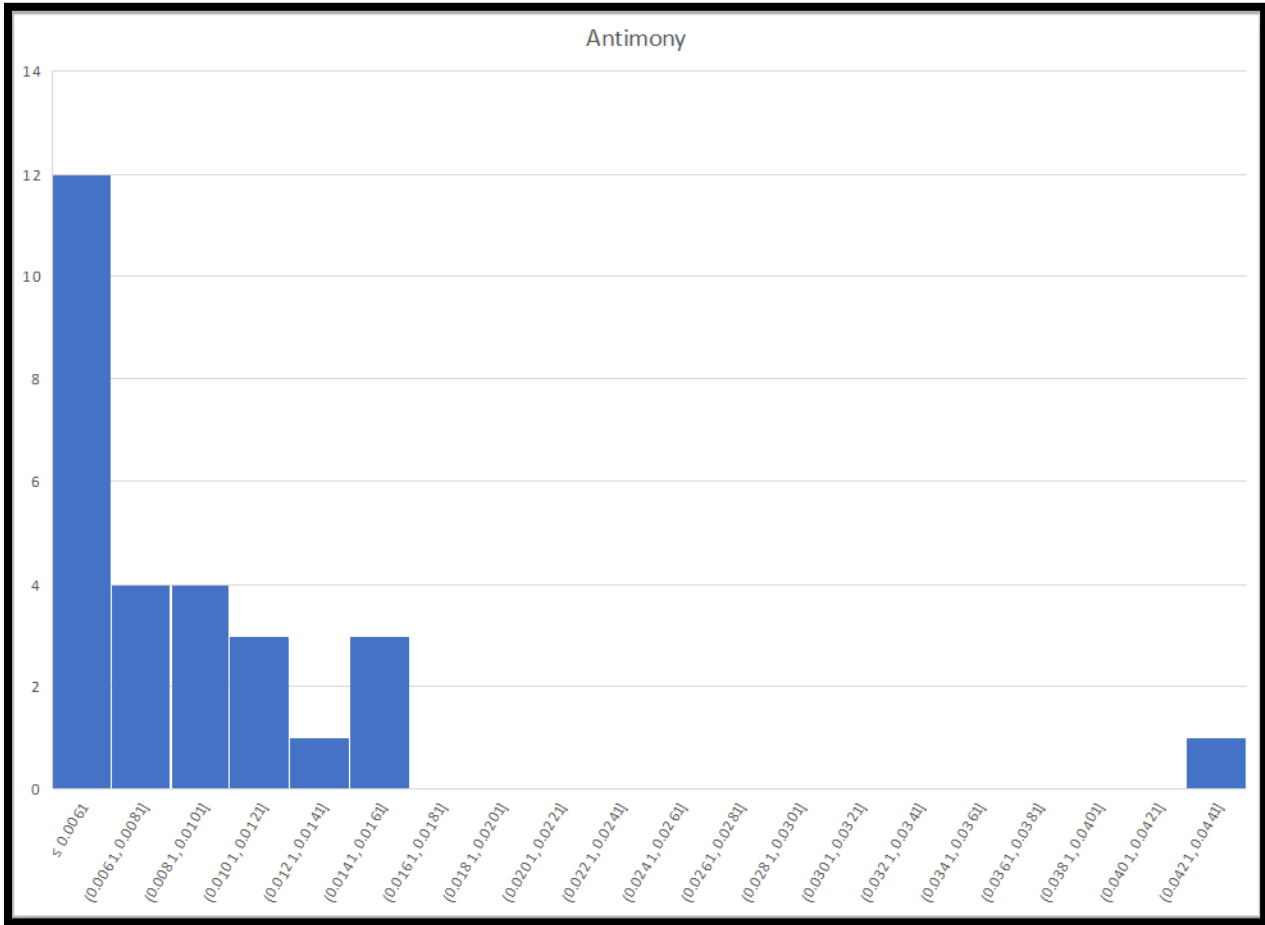


Figure 3: Average antimony concentrations of the 14-63 day tests for individual cylinders.

4.2.2 Acid Generation

The definition of inert material at A.R.S. § 49-201.22 requires that overburden and wall rock be demonstrated to not be acid-generating, taking into account acid neutralization potential, before being determined to be inert (in addition to not leaching substances in excess of numeric AWQS). Although neither the raw tailings nor the CPTB qualify as overburden or wall rock, South32 performed an acid-base accounting analysis of raw tailings samples used in preparation of the CPTB cylinders, and measured pH in all samples during the EPA Method 1315 testing.

Table 2 summarizes the acid-base accounting analyses of the raw tailings. The results for individual samples of raw tailings used in preparation of CPTB were weighted to represent the mix of orebody lithologies anticipated to produce the tailings. The weighted average Net Neutralization

Potential (NNP) of the tailings was calculated to be +81 tons CaCO₃/kton rock, which means the material can be considered non-acid generating. Note that there is no cement in the raw tailings samples. Cement addition will increase the acid neutralization potential of the material. The raw tailings, in aggregate, are not acid-generating, and the addition of cement prior to placement of CPTB will only serve to increase the NNP.

The pH was measured in each bucket after each step of the EPA 1315 testing. Results are provided on Table 1. The pH levels were always alkaline, further supporting that the CPTB will not be acid-generating. These pH results are not unexpected, as even with an acid forming NNP, subaqueous deposition of material will isolate it from oxygen and suppress any oxidation of sulfide minerals that might lead to acid generation.

5. Conclusions

Based on the data presented herein, South32 concludes that:

- EPA Method 1315 is the appropriate method for characterizing how constituents will diffuse from a monolithic material, CPTB, into groundwater after the underground workings refill at the end of mining.
- Method 1315 prescribes the use of distilled water to evaluate diffusion. This results in a maximum chemical gradient that provides the opportunity to repeatedly reach equilibrium conditions. This establishes a ceiling on the chemical concentrations that can be sustained by CPTB.
- The analyses conducted in support of this DOA application indicate that CPTB meets the definition of inertness. In aggregate CPTB leaches regulated constituents below AWQs.
- The raw tailings and the CPTB are not acid-generating, based on acid-base accounting analysis of raw tailings and the pH test solutions from the EPA Method 1315 analyses.

6. References

- Fall, Mamadou and Mukesh Pokharel, 2010. Coupled effects of sulphate and temperature on the strength development of cemented tailings backfills: Portland cement-paste backfill. *Cement & Concrete Composites* 32 (2010) p 819-828.
- Grice, A.G., B.M. Fallaw, and M. Yumlu, 2009. Mine Backfill System Design – Current Best Practice. MineAdvanTech, Jodhpur, India, Feb 2009, p. 213-216.
- Kosson, D.S., H.A. van der Sloot, F. Sanchez, and A.C. Garrabrants. 2002. An Integrated Framework for Evaluating Leaching in Waste Management and Utilization of Secondary Materials. *Environmental Engineering Science* 19(3): 159-204.
- Kosson, D.S., H.A. van der Sloot, A.C. Garrabrants, and P.F.A.B. Seignette, "Leaching Test Relationships, Laboratory-to-Field Comparisons and Recommendations for Leaching Evaluation using the Leaching Environmental Assessment Framework", EPA-600/R-14/061, U.S. EPA Office of Research and Development, Air Pollution Control Division, October 2014.
- Schafer, William, 2016. Geochemical Evaluation of Cemented Paste Tailings in a Flooded Underground Mine, International Mine Water Association Proceedings IMWA 2016, Freiberg/Germany | Drebenstedt, Carsten, Paul, Michael (eds.) | Mining Meets Water – Conflicts and Solutions, 14 pp.

TABLES

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					14-63 Day	Average												
CONCHA 1 72.5% S 1% OPC-2-HR	1.0%	10.63	0.08	0.08	0.0005		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0043	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-1-DAY	1.0%	11.06	1.00	0.92	0.0022		0.0002	0.022	0.00025	0.00025	0.0020	0.35	0.0135	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-2-DAY	1.0%	11.13	2.00	1.08	0.0019		0.0003	0.035	0.00025	0.00008	0.0020	0.35	0.0067	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-7-DAY	1.0%	11.37	7.00	5.92	0.0026		0.0006	0.040	0.00025	0.00025	0.0009	0.35	0.0283	0.0010	0.040	0.0006	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-14-DAY	1.0%	11.27	14.00	8.08	0.0026		0.0006	0.041	0.00025	0.00025	0.0006	0.35	0.0233	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-28-DAY	1.0%	11.69	28.00	19.92	0.0034		0.0010	0.050	0.00025	0.00025	0.0020	0.35	0.0345	0.0010	0.040	0.0008	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-42-DAY	1.0%	11.12	42.00	22.08	0.0035		0.0009	0.049	0.00025	0.00025	0.0020	0.35	0.0275	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-49-DAY	1.0%	10.8	49.00	26.92	0.0030		0.0009	0.030	0.00025	0.00025	0.0020	0.35	0.0110	0.0010	0.040	0.0005	0.0005	0.0005
CONCHA 1 72.5% S 1% OPC-63-DAY	1.0%	11.02	63.00	36.08	0.0042	0.0034	0.0012	0.032	0.00025	0.00025	0.0020	0.35	0.0131	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-2-HR	2.5%	9.7	0.08	0.08	0.0012		0.0002	0.035	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-1-DAY	2.5%	10.32	1.00	0.92	0.0051		0.0006	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0005	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-2-DAY	2.5%	10.41	2.00	1.08	0.0045		0.0008	0.035	0.00025	0.00017	0.0020	0.35	0.0004	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-7-DAY	2.5%	10.55	7.00	5.92	0.0096		0.0021	0.011	0.00025	0.00025	0.0020	0.35	0.0014	0.0010	0.040	0.0009	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-14-DAY	2.5%	10.34	14.00	8.08	0.0096		0.0024	0.011	0.00025	0.00025	0.0020	0.35	0.0011	0.0010	0.040	0.0008	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-28-DAY	2.5%	11.02	28.00	19.92	0.0131		0.0038	0.010	0.00025	0.00025	0.0020	0.35	0.0016	0.0010	0.040	0.0012	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-42-DAY	2.5%	10.19	42.00	22.08	0.0133		0.0040	0.012	0.00025	0.00025	0.0020	0.35	0.0011	0.0010	0.040	0.0010	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-49-DAY	2.5%	10.04	49.00	26.92	0.0088		0.0033	0.035	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 1 72.5% S 2.5% OPC-63-DAY	2.5%	10.46	63.00	36.08	0.0135	0.0117	0.0044	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0008	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-2-HR	4.0%	9.76	0.08	0.08	0.0010		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0003	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-1-DAY	4.0%	10.44	1.00	0.92	0.0045		0.0006	0.033	0.00025	0.00025	0.0020	0.35	0.0009	0.0010	0.040	0.0008	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-2-DAY	4.0%	10.45	2.00	1.08	0.0045		0.0008	0.025	0.00025	0.00006	0.0020	0.35	0.0006	0.0010	0.040	0.0008	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-7-DAY	4.0%	10.71	7.00	5.92	0.0082		0.0018	0.055	0.00025	0.00025	0.0020	0.35	0.0022	0.0010	0.040	0.0012	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-14-DAY	4.0%	10.45	14.00	8.08	0.0094		0.0026	0.060	0.00025	0.00025	0.0020	0.35	0.0024	0.0010	0.040	0.0013	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-28-DAY	4.0%	11.2	28.00	19.92	0.0113		0.0035	0.066	0.00025	0.00025	0.0020	0.35	0.0033	0.0010	0.040	0.0017	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-42-DAY	4.0%	10.33	42.00	22.08	0.0109		0.0032	0.057	0.00025	0.00025	0.0020	0.35	0.0026	0.0010	0.040	0.0015	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-49-DAY	4.0%	10.13	49.00	26.92	0.0074		0.0028	0.037	0.00025	0.00025	0.0020	0.35	0.0010	0.0010	0.040	0.0009	0.0005	0.0005
CONCHA 1 72.5% S 4% ARIZONA 1P-63-DAY	4.0%	10.51	63.00	36.08	0.0097	0.0098	0.0031	0.036	0.00025	0.00025	0.0020	0.35	0.0010	0.0010	0.040	0.0010	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-2-HR	4.0%	9.75	0.08	0.08	0.0016		0.0007	0.035	0.00025	0.00025	0.0020	0.35	0.0006	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-1-DAY	4.0%	10.25	1.00	0.92	0.0055		0.0018	0.035	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-2-DAY	4.0%	10.39	2.00	1.08	0.0047		0.0021	0.035	0.00025	0.00590	0.0020	0.35	0.0004	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-7-DAY	4.0%	10.57	7.00	5.92	0.0121		0.0068	0.018	0.00025	0.00025	0.0020	0.35	0.0050	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-14-DAY	4.0%	10.44	14.00	8.08	0.0124		0.0084	0.018	0.00025	0.00005	0.0020	0.35	0.0055	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-28-DAY	4.0%	11.08	28.00	19.92	0.0171		0.0123	0.018	0.00025	0.00025	0.0020	0.35	0.0079	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-42-DAY	4.0%	10.28	42.00	22.08	0.0164		0.0123	0.020	0.00025	0.00025	0.0020	0.35	0.0069	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-49-DAY	4.0%	10.14	49.00	26.92	0.0105		0.0085	0.013	0.00025	0.00025	0.0020	0.35	0.0020	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 4% LAFARGE-63-DAY	4.0%	10.49	63.00	36.08	0.0166	0.0146	0.0125	0.014	0.00025	0.00025	0.0020	0.35	0.0036	0.0010	0.040	0.0003	0.0005	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony 14-63 Day		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					Antimony	Average												
CONCHA 1 72.5% S 7% ARIZONA 1P-2-HR	7.0%	9.97	0.08	0.08	0.0007		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0006	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-1-DAY	7.0%	10.51	1.00	0.92	0.0032		0.0006	0.045	0.00025	0.00025	0.0020	0.35	0.0019	0.0010	0.040	0.0006	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-2-DAY	7.0%	10.72	2.00	1.08	0.0030		0.0007	0.038	0.00025	0.00025	0.0020	0.35	0.0014	0.0010	0.040	0.0005	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-7-DAY	7.0%	10.9	7.00	5.92	0.0049		0.0015	0.074	0.00025	0.00005	0.0008	0.35	0.0047	0.0010	0.040	0.0009	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-14-DAY	7.0%	10.56	14.00	8.08	0.0056		0.0018	0.081	0.00025	0.00025	0.0008	0.35	0.0046	0.0010	0.040	0.0010	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-28-DAY	7.0%	11.29	28.00	19.92	0.0064		0.0022	0.104	0.00025	0.00025	0.0008	0.35	0.0071	0.0010	0.040	0.0013	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-42-DAY	7.0%	10.55	42.00	22.08	0.0062		0.0019	0.096	0.00025	0.00025	0.0006	0.35	0.0063	0.0010	0.040	0.0011	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-49-DAY	7.0%	10.35	49.00	26.92	0.0045		0.0016	0.064	0.00025	0.00025	0.0020	0.35	0.0028	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 1 72.5% S 7% ARIZONA 1P-63-DAY	7.0%	10.65	63.00	36.08	0.0064	0.0058	0.0020	0.073	0.00025	0.00025	0.0006	0.35	0.0035	0.0010	0.040	0.0010	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-2-HR	7.0%	8.95	0.08	0.08	0.0011		0.0003	0.035	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-1-DAY	7.0%	9.76	1.00	0.92	0.0037		0.0012	0.035	0.00025	0.00025	0.0020	0.35	0.0007	0.0010	0.040	0.0005	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-2-DAY	7.0%	10.13	2.00	1.08	0.0033		0.0013	0.035	0.00025	0.00025	0.0020	0.35	0.0006	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-7-DAY	7.0%	10.26	7.00	5.92	0.0092		0.0041	0.015	0.00025	0.00012	0.0020	0.35	0.0033	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-14-DAY	7.0%	9.93	14.00	8.08	0.0105		0.0071	0.014	0.00025	0.00025	0.0020	0.35	0.0031	0.0010	0.040	0.0002	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-28-DAY	7.0%	10.68	28.00	19.92	0.0151		0.0088	0.013	0.00025	0.00025	0.0005	0.35	0.0027	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-42-DAY	7.0%	9.8	42.00	22.08	0.0124		0.0094	0.016	0.00025	0.00025	0.0020	0.35	0.0031	0.0010	0.040	0.0004	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-49-DAY	7.0%	9.73	49.00	26.92	0.0065		0.0060	0.010	0.00025	0.00025	0.0020	0.35	0.0010	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 1 72.5% S 7% LAFARGE-63-DAY	7.0%	10.16	63.00	36.08	0.0109	0.0111	0.0087	0.011	0.00025	0.00025	0.0020	0.35	0.0017	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 2 72.5% S 2.5% OPC-2-HR	2.5%	9.81	0.08	0.08	0.0008		0.0005	0.035	0.00025	0.00025	0.0020	0.35	0.0003	0.0010	0.040	0.0003	0.0005	0.0005
CONCHA 2 72.5% S 2.5% OPC-1-DAY	2.5%	10.5	1.00	0.92	0.0033		0.0005	0.035	0.00025	0.00025	0.0020	0.35	0.0006	0.0010	0.040	0.0011	0.00013	0.0005
CONCHA 2 72.5% S 2.5% OPC-2-DAY	2.5%	10.59	2.00	1.08	0.0028		0.0006	0.035	0.00025	0.00021	0.0020	0.35	0.0003	0.0010	0.040	0.0008	0.00011	0.0005
CONCHA 2 72.5% S 2.5% OPC-7-DAY	2.5%	10.88	7.00	5.92	0.0063		0.0015	0.016	0.00025	0.00025	0.0020	0.35	0.0026	0.0010	0.040	0.0023	0.00017	0.0005
CONCHA 2 72.5% S 2.5% OPC-14-DAY	2.5%	10.73	14.00	8.08	0.0078		0.0021	0.017	0.0025	0.00250	0.0200	0.35	0.0030	0.0010	0.040	0.0027	0.005	0.005
CONCHA 2 72.5% S 2.5% OPC-28-DAY	2.5%	11.23	28.00	19.92	0.0102		0.0032	0.016	0.00025	0.00025	0.0020	0.35	0.0041	0.0010	0.040	0.0033	0.00024	0.0005
CONCHA 2 72.5% S 2.5% OPC-42-DAY	2.5%	10.34	42.00	22.08	0.0104		0.0031	0.016	0.00025	0.00025	0.0020	0.35	0.0027	0.0010	0.040	0.0029	0.00022	0.0005
CONCHA 2 72.5% S 2.5% OPC-49-DAY	2.5%	10.07	49.00	26.92	0.0076		0.0026	0.010	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0016	0.00012	0.0005
CONCHA 2 72.5% S 2.5% OPC-63-DAY	2.5%	10.56	63.00	36.08	0.0119	0.0096	0.0034	0.010	0.00025	0.00025	0.0020	0.35	0.0013	0.0010	0.040	0.0024	0.00018	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-2-HR	4.0%	9.86	0.08	0.08	0.0015		0.0006	0.035	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0007	0.0005	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-1-DAY	4.0%	10.46	1.00	0.92	0.0050		0.0014	0.039	0.00025	0.00025	0.0020	0.35	0.0009	0.0010	0.040	0.0020	0.0002	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-2-DAY	4.0%	10.36	2.00	1.08	0.0044		0.0013	0.032	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0016	0.00014	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-7-DAY	4.0%	10.72	7.00	5.92	0.0077		0.0025	0.070	0.00025	0.00025	0.0005	0.35	0.0040	0.0010	0.040	0.0031	0.00025	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-14-DAY	4.0%	10.47	14.00	8.08	0.0081		0.0028	0.066	0.00025	0.00025	0.0020	0.35	0.0034	0.0010	0.040	0.0028	0.00023	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-28-DAY	4.0%	11.19	28.00	19.92	0.0099		0.0037	0.084	0.00025	0.00025	0.0005	0.35	0.0058	0.0010	0.040	0.0038	0.00023	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-42-DAY	4.0%	10.31	42.00	22.08	0.0094		0.0033	0.073	0.00025	0.00025	0.0020	0.35	0.0049	0.0010	0.040	0.0032	0.00019	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-49-DAY	4.0%	10.24	49.00	26.92	0.0071		0.0029	0.048	0.00025	0.00025	0.0020	0.35	0.0009	0.0010	0.040	0.0019	0.00012	0.0005
CONCHA 2 72.5% S 4% ARIZONA 1P-63-DAY	4.0%	10.61	63.00	36.08	0.0098	0.0089	0.0038	0.054	0.00025	0.00025	0.0005	0.35	0.0026	0.0010	0.040	0.0030	0.00017	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					14-63 Day	Average												
EPITAPH 1 72.5% S 2.5% OPC-2-HR	2.5%	10.18	0.08	0.08	0.0010		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0013	0.0010	0.040	0.0002	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-1-DAY	2.5%	10.69	1.00	0.92	0.0037		0.0003	0.025	0.00025	0.00025	0.0020	0.35	0.0056	0.0010	0.040	0.0005	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-2-DAY	2.5%	10.75	2.00	1.08	0.0029		0.0003	0.017	0.00025	0.00041	0.0020	0.35	0.0026	0.0010	0.040	0.0003	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-7-DAY	2.5%	10.97	7.00	5.92	0.0057		0.0008	0.052	0.00025	0.00025	0.0020	0.35	0.0164	0.0010	0.040	0.0009	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-14-DAY	2.5%	10.71	14.00	8.08	0.0048		0.0008	0.040	0.00025	0.00025	0.0020	0.35	0.0086	0.0010	0.040	0.0008	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-28-DAY	2.5%	11.31	28.00	19.92	0.0071		0.0016	0.047	0.00025	0.00025	0.0020	0.35	0.0123	0.0010	0.040	0.0012	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-42-DAY	2.5%	10.55	42.00	22.08	0.0069		0.0016	0.037	0.00025	0.00025	0.0020	0.35	0.0073	0.0010	0.040	0.0011	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-49-DAY	2.5%	10.25	49.00	26.92	0.0045		0.0013	0.019	0.00025	0.00025	0.0020	0.35	0.0021	0.0010	0.040	0.0006	0.0005	0.0005
EPITAPH 1 72.5% S 2.5% OPC-63-DAY	2.5%	10.65	63.00	36.08	0.0068	0.0060	0.0019	0.022	0.000117	0.00011	0.0020	0.35	0.0024	0.0010	0.040	0.0008	0.00014	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-2-HR	4.0%	9.91	0.08	0.08	0.0013		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0003	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-1-DAY	4.0%	10.5	1.00	0.92	0.0039		0.0004	0.042	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0008	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-2-DAY	4.0%	10.49	2.00	1.08	0.0032		0.0005	0.043	0.00025	0.00073	0.0020	0.35	0.0005	0.0010	0.040	0.0006	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-7-DAY	4.0%	10.76	7.00	5.92	0.0064		0.0011	0.091	0.00025	0.00025	0.0020	0.35	0.0035	0.0010	0.040	0.0014	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-14-DAY	4.0%	10.61	14.00	8.08	0.0060		0.0011	0.089	0.00025	0.00025	0.0020	0.35	0.0026	0.0010	0.040	0.0012	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-28-DAY	4.0%	11.18	28.00	19.92	0.0078		0.0016	0.098	0.00025	0.00025	0.0005	0.35	0.0036	0.0010	0.040	0.0017	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-42-DAY	4.0%	10.23	42.00	22.08	0.0068		0.0013	0.084	0.00025	0.00025	0.0020	0.35	0.0025	0.0010	0.040	0.0014	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-49-DAY	4.0%	10.08	49.00	26.92	0.0045		0.0012	0.050	0.00025	0.00025	0.0020	0.35	0.0007	0.0010	0.040	0.0008	0.0005	0.0005
EPITAPH 72.5% S 4% ARIZONA 1P-63-DAY	4.0%	10.51	63.00	36.08	0.0070	0.0064	0.0016	0.060	0.00025	0.00025	0.0020	0.35	0.0011	0.0010	0.040	0.0011	0.0005	0.0005
MIX 1 CYLINDER B (499G)- 2 HR	7.0%	NA	0.08	0.08	0.0020		0.0004	0.014	0.00025	0.00025	0.0020	0.35	0.0009	0.0010	0.001	0.0003	0.0005	#N/A
MIX 1 CYLINDER B (499G)- 24 HR	7.0%	NA	1	0.92	0.0011		0.0003	0.077	0.000087	0.00025	0.0026	0.35	0.0089	0.0010	0.001	0.0003	0.00037	#N/A
MIX 1 CYLINDER B (499G)- 48 HR	7.0%	NA	2	1.08	0.0010		0.0010	0.053	0.00025	0.00025	0.0022	0.35	0.0050	0.0010	0.001	0.0003	0.00026	#N/A
MIX 1 CYLINDER B (499G)- 7 DAY	7.0%	NA	7	5.92	0.0018		0.0007	0.139	0.00025	0.00025	0.0065	0.35	0.0273	0.0010	0.000	0.0002	0.00054	#N/A
MIX 1 CYLINDER B (499G)- 14 DAY	7.0%	NA	14	8.08	0.0017		0.0010	0.125	0.00025	0.00025	0.0039	0.35	0.0233	0.0010	0.001	0.0006	0.00045	#N/A
MIX 1 CYLINDER B (499G)- 14 DAY	7.0%	NA	14	8.08	0.0017		0.0010	0.125	0.00025	0.00025	0.0039	0.35	0.0233	0.0010	0.001	0.0006	0.00045	#N/A
MIX 1 CYLINDER B (499G)- 28 DAY	7.0%	NA	28	5.92	0.0021		0.0014	0.157	0.00025	0.00025	0.0025	0.28	0.0308	0.0010	0.001	0.0009	0.00054	#N/A
MIX 1 CYLINDER B (499G)- 42 DAY	7.0%	NA	42	22.08	0.0024		0.0016	0.128	0.00025	0.00025	0.0019	1.21	0.0193	0.0010	0.001	0.0010	0.00049	#N/A
MIX 1 CYLINDER B (499G)- 49 DAY	7.0%	NA	49	19.92	0.0022		0.0013	0.070	0.00025	0.00025	0.0014	0.39	0.0070	0.0010	0.001	0.0006	0.00034	#N/A
MIX 1 CYLINDER B (499G)- 63 DAY	7.0%	NA	63	29.08	0.0027	0.0021	0.0016	0.080	0.00025	0.00025	0.0019	0.35	0.0080	0.0010	0.000	0.0027	0.00037	#N/A
MIX 2 CYLINDER A (504.9G)- 2 HR	10.0%	NA	0.08	0.08	0.0020		0.0010	0.031	0.00025	0.00025	0.0020	0.35	0.0022	0.0010	0.001	0.0005	0.0005	#N/A
MIX 2 CYLINDER A (504.9G)- 24 HR	10.0%	NA	1	0.92	0.0008		0.0010	0.135	0.00025	0.00025	0.0018	0.35	0.0164	0.0010	0.001	0.0003	0.00032	#N/A
MIX 2 CYLINDER A (504.9G)- 48 HR	10.0%	NA	2	1.08	0.0008		0.0010	0.092	0.00025	0.00025	0.0018	0.35	0.0099	0.0010	0.001	0.0003	0.00024	#N/A
MIX 2 CYLINDER A (504.9G)- 7 DAY	10.0%	NA	7	5.92	0.0012		0.0004	0.235	0.00025	0.00025	0.0049	0.35	0.0447	0.0010	0.001	0.0003	0.00047	#N/A
MIX 2 CYLINDER A (504.9G)- 14 DAY	10.0%	NA	14	8.08	0.0015		0.0006	0.239	0.00025	0.00025	0.0037	0.35	0.0399	0.0010	0.001	0.0006	0.00041	#N/A
MIX 2 CYLINDER A (504.9G)- 28 DAY	10.0%	NA	28	19.92	0.0014		0.0008	0.328	0.00025	0.00025	0.0026	0.35	0.0521	0.0010	0.001	0.0006	0.00051	#N/A
MIX 2 CYLINDER A (504.9G)- 42 DAY	10.0%	NA	42	22.08	0.0015		0.0009	0.254	0.00025	0.00025	0.0018	0.35	0.0352	0.0010	0.001	0.0006	0.00047	#N/A
MIX 2 CYLINDER A (504.9G)- 49 DAY	10.0%	NA	49	26.92	0.0016		0.0009	0.142	0.00025	0.00025	0.0013	0.35	0.0130	0.0010	0.001	0.0004	0.00034	#N/A
MIX 2 CYLINDER A (504.9G)- 63 DAY	10.0%	NA	63	36.08	0.0018	0.0016	0.0011	0.160	0.00025	0.00025	0.0016	0.35	0.0161	0.0010	0.001	0.0020	0.00038	#N/A

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					14-63 Day	Average												
MIX 3 CYLINDER B (493.9G)- 2 HR	12.0%	NA	0.08	0.08	0.0020		0.0010	0.029	0.00025	0.00025	0.0009	0.35	0.0019	0.0010	0.001	0.0005	0.0005	#N/A
MIX 3 CYLINDER B (493.9G)- 24 HR	12.0%	NA	1	0.92	0.0006		0.0010	0.145	0.00025	0.00025	0.0044	0.35	0.0172	0.0010	0.001	0.0003	0.00043	#N/A
MIX 3 CYLINDER B (493.9G)- 48 HR	12.0%	NA	2	1.08	0.0007		0.0010	0.094	0.00025	0.00025	0.0039	0.35	0.0107	0.0010	0.001	0.0003	0.00031	#N/A
MIX 3 CYLINDER B (493.9G)- 7 DAY	12.0%	NA	7	5.92	0.0010		0.0003	0.246	0.00025	0.00025	0.0135	0.35	0.0539	0.0010	0.001	0.0003	0.00062	#N/A
MIX 3 CYLINDER B (493.9G)- 14 DAY	12.0%	NA	14	8.08	0.0011		0.0005	0.241	0.00025	0.00025	0.0115	0.35	0.0469	0.0010	0.001	0.0005	0.00055	#N/A
MIX 3 CYLINDER B (493.9G)- 28 DAY	12.0%	NA	28	19.92	0.0013		0.0006	0.352	0.00025	0.00025	0.0091	0.35	0.0629	0.0010	0.001	0.0007	0.00069	#N/A
MIX 3 CYLINDER B (493.9G)- 42 DAY	12.0%	NA	42	22.08	0.0013		0.0007	0.311	0.00025	0.00025	0.0044	0.35	0.0432	0.0010	0.001	0.0007	0.00064	#N/A
MIX 3 CYLINDER B (493.9G)- 49 DAY	12.0%	NA	49	26.92	0.0014		0.0007	0.178	0.00025	0.00025	0.0023	0.35	0.0159	0.0010	0.001	0.0005	0.00044	#N/A
MIX 3 CYLINDER B (493.9G)- 63 DAY	12.0%	NA	63	36.08	0.0015	0.0013	0.0009	0.223	0.00025	0.00025	0.0025	0.35	0.0204	0.0010	0.001	0.0023	0.00048	#N/A
100% Concha 1 OSC - 2% -2 HR	2%	9.63	0.08	0.08	0.0016		0.0010	0.035	0.00025	0.00025	0.0020	0.18	0.0009	0.0010	0.040	0.0004	0.0005	0.0005
100% Concha 1 OSC - 2% -1 DAY	2%	10.05	1	0.92	0.0070		0.0005	0.018	0.00025	0.00008	0.0007	0.21	0.0027	0.0010	0.040	0.0009	0.00013	0.0005
100% Concha 1 OSC - 2% -2 DAY	2%	9.41	2	1.08	0.0061		0.0005	0.013	0.00025	0.00011	0.0006	0.35	0.0017	0.0010	0.040	0.0008	0.00017	0.0001
100% Concha 1 OSC - 2% -7 DAY	2%	9.73	7	5.92	0.0112		0.0009	0.025	0.00025	0.00006	0.0005	0.35	0.0048	0.0010	0.040	0.0013	0.00013	0.0005
100% Concha 1 OSC - 2% -14 DAY	2%	10.22	14	8.08	0.0097		0.0007	0.020	0.00025	0.00025	0.0020	0.35	0.0039	0.0010	0.040	0.0014	0.0005	0.0005
100% Concha 1 OSC - 2% -28 DAY	2%	9.48	28	19.92	0.0143		0.0016	0.022	0.00025	0.00006	0.0020	0.35	0.0035	0.0010	0.040	0.0022	0.0005	0.0005
100% Concha 1 OSC - 2% -42 DAY	2%	9.94	42	22.08	0.0160		0.0009	0.014	0.00025	0.00025	0.0020	0.16	0.0014	0.0010	0.040	0.0037	0.0005	0.0005
100% Concha 1 OSC - 2% -49 DAY	2%	9.94	49	26.92	0.0105		0.0004	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0019	0.0005	0.0005
100% Concha 1 OSC - 2% -63 DAY	2%	10.01	63	36.08	0.0149	0.0131	0.0006	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0025	0.00011	0.0005
100% Concha 1 OSC - 4% -2 HR	4%	9.96	0.08	0.08	0.0010		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0004	0.0005	0.0005
100% Concha 1 OSC - 4% -1 DAY	4%	10.32	1	0.92	0.0037		0.0002	0.018	0.00025	0.00025	0.0011	0.35	0.0016	0.0010	0.040	0.0008	0.00015	0.0005
100% Concha 1 OSC - 4% -2 DAY	4%	9.69	2	1.08	0.0037		0.0010	0.014	0.00025	0.00006	0.0009	0.35	0.0010	0.0010	0.040	0.0009	0.00015	0.0005
100% Concha 1 OSC - 4% -7 DAY	4%	10.15	7	5.92	0.0059		0.0004	0.028	0.00025	0.00025	0.0010	0.35	0.0038	0.0010	0.040	0.0010	0.00019	0.0005
100% Concha 1 OSC - 4% -14 DAY	4%	10.56	14	8.08	0.0053		0.0003	0.030	0.00025	0.00025	0.0020	0.35	0.0065	0.0010	0.040	0.0008	0.00011	0.0005
100% Concha 1 OSC - 4% -28 DAY	4%	9.86	28	19.92	0.0061		0.0009	0.040	0.00025	0.00025	0.0020	0.35	0.0114	0.0010	0.040	0.0009	0.0005	0.0005
100% Concha 1 OSC - 4% -42 DAY	4%	10.49	42	22.08	0.0070		0.0004	0.032	0.00025	0.00025	0.0020	0.35	0.0066	0.0010	0.040	0.0023	0.0005	0.0005
100% Concha 1 OSC - 4% -49 DAY	4%	10.5	49	26.92	0.0069		0.0002	0.013	0.00025	0.00025	0.0020	0.35	0.0019	0.0010	0.040	0.0017	0.0005	0.0005
100% Concha 1 OSC - 4% -63 DAY	4%	10.63	63	36.08	0.0085	0.0068	0.0002	0.013	0.00025	0.00025	0.0020	0.35	0.0019	0.0010	0.040	0.0021	0.0005	0.0005
100% Concha 1 OSC - 7% -2 HR	7%	10.21	0.08	0.08	0.0006		0.0010	0.035	0.00025	0.00025	0.0006	0.35	0.0006	0.0010	0.040	0.0004	0.0005	0.0005
100% Concha 1 OSC - 7% -1 DAY	7%	10.62	1	0.92	0.0031		0.0003	0.015	0.00025	0.00025	0.0019	0.35	0.0020	0.0010	0.040	0.0007	0.00011	0.0005
100% Concha 1 OSC - 7% -2 DAY	7%	10.09	2	1.08	0.0027		0.0010	0.013	0.00025	0.00025	0.0012	0.35	0.0015	0.0010	0.040	0.0007	0.0005	0.0005
100% Concha 1 OSC - 7% -7 DAY	7%	10.61	7	5.92	0.0038		0.0004	0.032	0.00025	0.00025	0.0016	0.35	0.0092	0.0010	0.040	0.0010	0.00011	0.0005
100% Concha 1 OSC - 7% -14 DAY	7%	10.95	14	8.08	0.0036		0.0003	0.031	0.00025	0.00025	0.0020	0.35	0.0103	0.0010	0.040	0.0011	0.0005	0.0005
100% Concha 1 OSC - 7% -28 DAY	7%	10.12	28	19.92	0.0046		0.0009	0.041	0.00025	0.00025	0.0020	0.35	0.0149	0.0010	0.040	0.0012	0.0005	0.0005
100% Concha 1 OSC - 7% -42 DAY	7%	10.74	42	22.08	0.0045		0.0005	0.040	0.00025	0.00025	0.0020	0.35	0.0136	0.0010	0.040	0.0019	0.0005	0.0005
100% Concha 1 OSC - 7% -49 DAY	7%	10.88	49	26.92	0.0043		0.0004	0.020	0.00025	0.00025	0.0020	0.35	0.0051	0.0010	0.040	0.0012	0.0005	0.0005
100% Concha 1 OSC - 7% -63 DAY	7%	11.02	63	36.08	0.0050	0.0044	0.0005	0.028	0.00025	0.00025	0.0020	0.35	0.0090	0.0010	0.040	0.0013	0.0005	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony 14-63 Day		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					Antimony	Average												
50% Concha 1 OSC 50% HSV MC 2022s - 4% -2 HR	4%	10.14	0.08	0.08	0.0016		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0018	0.0010	0.040	0.0004	0.0005	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -1 DAY	4%	10.53	1	0.92	0.0070		0.0004	0.023	0.00025	0.00025	0.0007	0.35	0.0035	0.0010	0.040	0.0008	0.00023	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -2 DAY	4%	9.81	2	1.08	0.0062		0.0004	0.017	0.00025	0.00025	0.0020	0.35	0.0020	0.0010	0.040	0.0009	0.00017	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -7 DAY	4%	10.56	7	5.92	0.0104		0.0009	0.036	0.00025	0.00025	0.0006	0.35	0.0083	0.0010	0.040	0.0012	0.00029	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -14 DAY	4%	10.81	14	8.08	0.0096		0.0010	0.031	0.00025	0.00025	0.0020	0.35	0.0081	0.0010	0.040	0.0013	0.00016	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -28 DAY	4%	10.3	28	19.92	0.0107		0.0017	0.042	0.00025	0.00025	0.0020	0.35	0.0124	0.0010	0.040	0.0013	0.00013	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -42 DAY	4%	10.69	42	22.08	0.0117		0.0015	0.034	0.00025	0.00025	0.0020	0.35	0.0084	0.0010	0.040	0.0027	0.00013	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -49 DAY	4%	10.85	49	26.92	0.0099		0.0008	0.016	0.00025	0.00025	0.0020	0.35	0.0034	0.0010	0.040	0.0017	0.00011	0.0005
50% Concha 1 OSC 50% HSV MC 2022s - 4% -63 DAY	4%	10.93	63	36.08	0.0126	0.0109	0.0014	0.019	0.00025	0.00025	0.0020	0.35	0.0047	0.0010	0.040	0.0021	0.00012	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-2 HR	4%	9.88	0.08	0.08	0.0006		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0005	0.0005	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-1 DAY	4%	10.35	1	0.92	0.0034		0.0003	0.023	0.00025	0.00025	0.0007	0.35	0.0022	0.0010	0.040	0.0013	0.00013	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-2 DAY	4%	9.79	2	1.08	0.0036		0.0003	0.017	0.00025	0.00025	0.0005	0.35	0.0013	0.0010	0.040	0.0012	0.0005	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-7 DAY	4%	10.36	7	5.92	0.0058		0.0006	0.034	0.00025	0.00025	0.0005	0.35	0.0037	0.0010	0.040	0.0015	0.00013	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-14 DAY	4%	10.58	14	8.08	0.0061		0.0006	0.026	0.00025	0.00025	0.0020	0.35	0.0035	0.0010	0.040	0.0018	0.00024	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-28 DAY	4%	10.04	28	19.92	0.0076		0.0017	0.033	0.00025	0.00067	0.0008	0.35	0.0052	0.0010	0.040	0.0027	0.00065	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-42 DAY	4%	10.63	42	22.08	0.0078		0.0007	0.024	0.00025	0.00025	0.0020	0.35	0.0029	0.0010	0.040	0.0035	0.0005	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-49 DAY	4%	10.84	49	26.92	0.0073		0.0006	0.013	0.00025	0.00025	0.0020	0.35	0.0017	0.0010	0.040	0.0025	0.0005	0.0005
50% Concha 1 OSC 50% Old Vol MC 2022 - 4%-63 DAY	4%	10.83	63	36.08	0.0089	0.0075	0.0006	0.012	0.00025	0.00025	0.0020	0.35	0.0017	0.0010	0.040	0.0031	0.0005	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -2 HR	4%	10.27	0.08	0.08	0.0006		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0038	0.0010	0.040	0.0003	0.0005	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -1 DAY	4%	10.81	1	0.92	0.0036		0.0002	0.029	0.00025	0.00006	0.0017	0.35	0.0106	0.0010	0.040	0.0007	0.00026	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -2 DAY	4%	10.15	2	1.08	0.0019		0.0005	0.016	0.00025	0.00025	0.0020	0.35	0.0010	0.0010	0.040	0.0005	0.00027	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -7 DAY	4%	10.79	7	5.92	0.0053		0.0006	0.044	0.00025	0.00025	0.0014	0.35	0.0229	0.0010	0.040	0.0008	0.00024	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -14 DAY	4%	10.95	14	8.08	0.0058		0.0006	0.038	0.00025	0.00025	0.0020	0.35	0.0212	0.0010	0.040	0.0010	0.00021	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -28 DAY	4%	10.47	28	19.92	0.0067		0.0010	0.048	0.00025	0.00025	0.0020	0.35	0.0307	0.0010	0.040	0.0009	0.00021	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -42 DAY	4%	10.83	42	22.08	0.0078		0.0010	0.040	0.00025	0.00025	0.0020	0.35	0.0202	0.0010	0.040	0.0019	0.00016	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -49 DAY	4%	11	49	26.92	0.0077		0.0006	0.021	0.00025	0.00025	0.0020	0.35	0.0095	0.0010	0.040	0.0013	0.0005	0.0005
50% Concha 1 OSC 50% jhHZ MC 2022 - 4% -63 DAY	4%	11.04	63	36.08	0.0091	0.0074	0.0009	0.022	0.00025	0.00025	0.0020	0.35	0.0100	0.0010	0.040	0.0015	0.00023	0.0005
100% Deeps MC 2021 - 4% -2 HR	4%	10.71	0.08	0.08	0.0006		0.0010	0.012	0.00025	0.00025	0.0020	0.35	0.0064	0.0010	0.040	0.0004	0.0001	0.0005
100% Deeps MC 2021 - 4% -1 DAY	4%	11.11	1	0.92	0.0019		0.0010	0.045	0.00025	0.00025	0.0009	0.35	0.0252	0.0010	0.040	0.0012	0.00028	0.0005
100% Deeps MC 2021 - 4% -2 DAY	4%	10.53	2	1.08	0.0018		0.0002	0.031	0.00025	0.00025	0.0008	0.35	0.0148	0.0010	0.040	0.0013	0.00029	0.0005
100% Deeps MC 2021 - 4% -7 DAY	4%	11.15	7	5.92	0.0022		0.0006	0.068	0.00025	0.00025	0.0017	0.35	0.0628	0.0010	0.040	0.0024	0.00048	0.0005
100% Deeps MC 2021 - 4% -14 DAY	4%	11.3	14	8.08	0.0021		0.0008	0.056	0.00025	0.00025	0.0011	0.35	0.0538	0.0010	0.040	0.0023	0.00043	0.0005
100% Deeps MC 2021 - 4% -28 DAY	4%	10.88	28	19.92	0.0024		0.0014	0.068	0.00025	0.00025	0.0009	0.35	0.0842	0.0010	0.040	0.0032	0.00046	0.0005
100% Deeps MC 2021 - 4% -42 DAY	4%	11.03	42	22.08	0.0028		0.0015	0.051	0.00025	0.00025	0.0006	0.35	0.0488	0.0010	0.040	0.0036	0.0004	0.0005
100% Deeps MC 2021 - 4% -49 DAY	4%	11.16	49	26.92	0.0026		0.0013	0.027	0.00025	0.00025	0.0020	0.35	0.0205	0.0010	0.040	0.0025	0.00029	0.0005
100% Deeps MC 2021 - 4% -63 DAY	4%	11.18	63	36.08	0.0030	0.0026	0.0017	0.029	0.00025	0.00025	0.0020	0.35	0.0224	0.0010	0.040	0.0029	0.00034	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					14-63 Day	Average												
100% Epitaph 1 OSC - 4%-2 HR	4%	10.59	0.08	0.08	0.0005		0.0010	0.035	0.00025	0.00025	0.0006	0.35	0.0014	0.0010	0.040	0.0002	0.00011	0.0005
100% Epitaph 1 OSC - 4%-1 DAY	4%	11	1	0.92	0.0022		0.0005	0.033	0.00025	0.00025	0.0029	0.35	0.0045	0.0010	0.040	0.0005	0.00037	0.0005
100% Epitaph 1 OSC - 4%-2 DAY	4%	10.02	2	1.08	0.0044		0.0003	0.021	0.00025	0.00025	0.0012	0.35	0.0062	0.0010	0.040	0.0006	0.0002	0.0005
100% Epitaph 1 OSC - 4%-7 DAY	4%	10.93	7	5.92	0.0032		0.0015	0.040	0.00025	0.00025	0.0037	0.35	0.0062	0.0010	0.040	0.0009	0.00051	0.0005
100% Epitaph 1 OSC - 4%-14 DAY	4%	11.15	14	8.08	0.0029		0.0017	0.049	0.00025	0.00025	0.0016	0.35	0.0092	0.0010	0.040	0.0010	0.00044	0.0005
100% Epitaph 1 OSC - 4%-28 DAY	4%	10.64	28	19.92	0.0036		0.0030	0.054	0.00025	0.00025	0.0010	0.35	0.0103	0.0010	0.040	0.0011	0.00044	0.0005
100% Epitaph 1 OSC - 4%-42 DAY	4%	10.94	42	22.08	0.0039		0.0029	0.040	0.00025	0.00025	0.0006	0.35	0.0063	0.0010	0.040	0.0018	0.00039	0.0005
100% Epitaph 1 OSC - 4%-49 DAY	4%	11.04	49	26.92	0.0036		0.0026	0.020	0.00025	0.00025	0.0020	0.35	0.0021	0.0010	0.040	0.0012	0.00032	0.0005
100% Epitaph 1 OSC - 4%-63 DAY	4%	11.05	63	36.08	0.0044	0.0037	0.0035	0.019	0.00025	0.00025	0.0006	0.35	0.0018	0.0010	0.040	0.0015	0.00035	0.0005
100% Epitaph 2 MC 2022 -2-HR	4%	10.09	0.08	0.08	0.0020		0.0010	0.027	0.00025	0.00025	0.0020	0.35	0.0278	0.0010	0.040	0.0001	0.0005	0.0005
100% Epitaph 2 MC 2022 -1-DAY	4%	11.05	1	0.92	0.0006		0.0010	0.116	0.00025	0.00025	0.0013	0.35	0.171	0.0010	0.040	0.0003	0.00014	0.0005
100% Epitaph 2 MC 2022 -2-DAY	4%	10.61	2	1.08	0.0005		0.0010	0.073	0.00025	0.00025	0.0009	0.35	0.0832	0.0010	0.040	0.0002	0.0005	0.0005
100% Epitaph 2 MC 2022 -7-DAY	4%	10.57	7	5.92	0.0006		0.0003	0.166	0.00025	0.00025	0.0025	0.35	0.306	0.0010	0.040	0.0004	0.00018	0.0005
100% Epitaph 2 MC 2022 -14-DAY	4%	11.08	14	8.08	0.0007		0.0003	0.135	0.00025	0.00025	0.0026	0.35	0.27	0.0010	0.040	0.0005	0.00014	0.0005
100% Epitaph 2 MC 2022 -14-DAY	4%	11.08	14	8.08	0.0007		0.0003	0.135	0.00025	0.00025	0.0026	0.35	0.27	0.0010	0.040	0.0005	0.00014	0.0005
100% Epitaph 2 MC 2022 -28-DAY	4%	11.19	28	5.92	0.0007		0.0004	0.128	0.00025	0.00025	0.0032	0.35	0.303	0.0010	0.040	0.0006	0.00011	0.0005
100% Epitaph 2 MC 2022 -42-DAY	4%	11.48	42	22.08	0.0008		0.0005	0.101	0.00025	0.00025	0.0024	0.35	0.219	0.0010	0.040	0.0006	0.0005	0.0005
100% Epitaph 2 MC 2022 -49-DAY	4%	10.9	49	19.92	0.0007		0.0004	0.052	0.00025	0.00025	0.0014	0.22	0.0803	0.0010	0.040	0.0013	0.0005	0.0005
100% Epitaph 2 MC 2022 -63-DAY	4%	10.95	63	29.08	0.0010	0.0007	0.0006	0.063	0.00025	0.00025	0.0019	0.35	0.115	0.0010	0.040	0.0014	0.00011	0.0005
100% Epitaph 1 MC 2021-2-HR	4%	10.05	0.08	0.08	0.0020		0.0010	0.014	0.00025	0.00025	0.0008	0.25	0.00717	0.0010	0.040	0.0001	0.0005	0.0005
100% Epitaph 1 MC 2021-1-DAY	4%	10.89	1	0.92	0.0007		0.0010	0.053	0.00025	0.00025	0.0046	0.35	0.0362	0.0010	0.040	0.0005	0.00012	0.0005
100% Epitaph 1 MC 2021-2-DAY	4%	10.54	2	1.08	0.0009		0.0010	0.040	0.00025	0.00025	0.0036	0.35	0.0201	0.0010	0.040	0.0005	0.0005	0.0005
100% Epitaph 1 MC 2021-7-DAY	4%	10.34	7	5.92	0.0016		0.0003	0.085	0.00025	0.00025	0.0078	0.35	0.0601	0.0010	0.040	0.0013	0.00019	0.0005
100% Epitaph 1 MC 2021-14-DAY	4%	11.11	14	8.08	0.0016		0.0003	0.082	0.00025	0.00025	0.0051	0.35	0.0515	0.0010	0.040	0.0010	0.00019	0.0005
100% Epitaph 1 MC 2021-28-DAY	4%	10.99	28	19.92	0.0018		0.0005	0.086	0.00025	0.00025	0.0026	0.35	0.051	0.0010	0.040	0.0012	0.00016	0.0005
100% Epitaph 1 MC 2021-42-DAY	4%	11.37	42	22.08	0.0019		0.0006	0.071	0.00025	0.00025	0.0007	0.35	0.0321	0.0010	0.040	0.0011	0.00012	0.0005
100% Epitaph 1 MC 2021-49-DAY	4%	11.01	49	26.92	0.0017		0.0004	0.041	0.00025	0.00025	0.0020	0.35	0.0124	0.0010	0.040	0.0012	0.0005	0.0005
100% Epitaph 1 MC 2021-63-DAY	4%	10.88	63	36.08	0.0021	0.0018	0.0007	0.051	0.00025	0.00025	0.0020	0.35	0.0141	0.0010	0.040	0.0016	0.0005	0.0005
100% HSV MC -2-HR	4%	8.99	0.08	0.08	0.0069		0.0008	0.035	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0006	0.00041	0.0005
100% HSV MC -1-DAY	4%	9.29	1	0.92	0.0315		0.0021	0.026	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0027	0.00149	0.0005
100% HSV MC -2-DAY	4%	9.28	2	1.08	0.0281		0.0019	0.017	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0022	0.00094	0.0005
100% HSV MC -7-DAY	4%	9.35	7	5.92	0.0453		0.0035	0.039	0.00025	0.00025	0.0006	0.35	0.00061	0.0010	0.040	0.0047	0.00177	0.0005
100% HSV MC -14-DAY	4%	9.88	14	8.08	0.0452		0.0037	0.027	0.00025	0.00025	0.0020	0.35	0.00066	0.0010	0.040	0.0032	0.00133	0.0005
100% HSV MC -28-DAY	4%	9.86	28	19.92	0.0502		0.0049	0.029	0.00025	0.00025	0.0020	0.35	0.0008	0.0010	0.040	0.0037	0.00125	0.0005
100% HSV MC -42-DAY	4%	10.2	42	22.08	0.0487		0.0045	0.023	0.00025	0.00025	0.0020	0.35	0.00074	0.0010	0.040	0.0035	0.00071	0.0005
100% HSV MC -49-DAY	4%	10.06	49	26.92	0.0323		0.0036	0.010	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0026	0.00031	0.0005
100% HSV MC -63-DAY	4%	9.98	63	36.08	0.0396	0.0432	0.0045	0.014	0.00025	0.00025	0.0020	0.35	0.00057	0.0010	0.040	0.0039	0.00037	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony 14-63 Day		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					Antimony	Average												
100% jhHZ MC 2022 -2-HR	4%	8.65	0.08	0.08	0.0014		0.0010	0.035	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0002	0.00014	0.0005
100% jhHZ MC 2022 -1-DAY	4%	9.6	1	0.92	0.0084		0.0005	0.018	0.00025	0.00025	0.0007	0.35	0.0002	0.0010	0.040	0.0005	0.00038	0.0005
100% jhHZ MC 2022 -2-DAY	4%	9.5	2	1.08	0.0091		0.0007	0.013	0.00025	0.00025	0.0006	0.35	0.0002	0.0010	0.040	0.0006	0.00028	0.0005
100% jhHZ MC 2022 -7-DAY	4%	9.81	7	5.92	0.0137		0.0010	0.022	0.00025	0.00025	0.0009	0.35	0.0004	0.0010	0.040	0.0009	0.00049	0.0005
100% jhHZ MC 2022 -14-DAY	4%	9.96	14	8.08	0.0148		0.0012	0.019	0.00025	0.00025	0.0007	0.35	0.0005	0.0010	0.040	0.0008	0.00049	0.0005
100% jhHZ MC 2022 -28-DAY	4%	9.91	28	19.92	0.0165		0.0015	0.016	0.00025	0.00025	0.0008	0.35	0.00054	0.0010	0.040	0.0008	0.00051	0.0005
100% jhHZ MC 2022 -42-DAY	4%	10.49	42	22.08	0.0174		0.0016	0.015	0.00025	0.00025	0.0006	0.35	0.00053	0.0010	0.040	0.0007	0.00035	0.0005
100% jhHZ MC 2022 -49-DAY	4%	10.32	49	26.92	0.0136		0.0012	0.035	0.00025	0.00025	0.0020	0.35	0.0003	0.0010	0.040	0.0008	0.0002	0.0005
100% jhHZ MC 2022 -63-DAY	4%	10.25	63	36.08	0.0175	0.0160	0.0015	0.010	0.00025	0.00025	0.0005	0.35	0.0004	0.0010	0.040	0.0009	0.00022	0.0005
100% Old Vol MC 2022 -2-HR	4%	8.3	0.08	0.08	0.0039		0.0005	0.035	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0015	0.0005	0.0005
100% Old Vol MC 2022 -1-DAY	4%	8.76	1	0.92	0.0121		0.0005	0.016	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0040	0.00017	0.0005
100% Old Vol MC 2022 -2-DAY	4%	8.66	2	1.08	0.0109		0.0006	0.010	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0030	0.0001	0.0005
100% Old Vol MC 2022 -7-DAY	4%	9.01	7	5.92	0.0166		0.0006	0.017	0.00025	0.00025	0.0020	0.35	0.0004	0.0010	0.040	0.0051	0.00017	0.0005
100% Old Vol MC 2022 -14-DAY	4%	8.94	14	8.08	0.0171		0.0012	0.011	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0042	0.00015	0.0005
100% Old Vol MC 2022 -28-DAY	4%	9.27	28	19.92	0.0184		0.0016	0.035	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0044	0.00013	0.0005
100% Old Vol MC 2022 -42-DAY	4%	9.33	42	22.08	0.0174		0.0016	0.011	0.00025	0.00025	0.0020	0.35	0.0005	0.0004	0.040	0.0047	0.0001	0.0005
100% Old Vol MC 2022 -49-DAY	4%	9.48	49	26.92	0.0120		0.0014	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0034	0.0005	0.0005
100% Old Vol MC 2022 -63-DAY	4%	9.21	63	36.08	0.0134	0.0157	0.0014	0.035	0.00025	0.00025	0.0020	0.35	0.0005	0.0010	0.040	0.0041	0.0005	0.0005
100% Scherrer 2 MC 2022 -2-HR	4%	10.24	0.08	0.08	0.0020		0.0004	0.013	0.00025	0.00025	0.0020	0.35	0.0095	0.0010	0.040	0.0004	0.00019	0.0005
100% Scherrer 2 MC 2022 -1-DAY	4%	11.02	1	0.92	0.0020		0.0004	0.031	0.00025	0.00025	0.0020	0.35	0.0244	0.0010	0.040	0.0014	0.00051	0.0005
100% Scherrer 2 MC 2022 -2-DAY	4%	10.76	2	1.08	0.0020		0.0010	0.022	0.00025	0.00025	0.0020	0.35	0.0149	0.0010	0.040	0.0012	0.00039	0.0005
100% Scherrer 2 MC 2022 -7-DAY	4%	11.04	7	5.92	0.0006		0.0005	0.045	0.00025	0.00025	0.0020	0.35	0.055	0.0010	0.040	0.0032	0.00091	0.0005
100% Scherrer 2 MC 2022 -14-DAY	4%	11.23	14	8.08	0.0007		0.0006	0.039	0.00025	0.00025	0.0020	0.35	0.0556	0.0010	0.040	0.0035	0.0009	0.0005
100% Scherrer 2 MC 2022 -28-DAY	4%	11.15	28	19.92	0.0008		0.0008	0.035	0.00025	0.00025	0.0005	0.35	0.066	0.0010	0.040	0.0044	0.00094	0.0005
100% Scherrer 2 MC 2022 -42-DAY	4%	11.59	42	22.08	0.0008		0.0007	0.034	0.00025	0.00025	0.0020	0.35	0.0769	0.0004	0.040	0.0046	0.00072	0.0005
100% Scherrer 2 MC 2022 -49-DAY	4%	11	49	26.92	0.0007		0.0007	0.016	0.00025	0.00025	0.0020	0.35	0.0167	0.0010	0.040	0.0034	0.0004	0.0005
100% Scherrer 2 MC 2022 -63-DAY	4%	10.92	63	36.08	0.0008	0.0008	0.0010	0.018	0.00025	0.00025	0.0020	0.35	0.0183	0.0010	0.040	0.0051	0.00047	0.0005
100% Scherrer 1 OSC -2-HR	4%	9.23	0.08	0.08	0.0061		0.0008	0.035	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0005	0.0002	0.0005
100% Scherrer 1 OSC -1-DAY	4%	9.76	1	0.92	0.0217		0.0014	0.011	0.00025	0.00025	0.0019	0.35	0.0005	0.0010	0.040	0.0015	0.00058	0.0005
100% Scherrer 1 OSC -2-DAY	4%	9.64	2	1.08	0.0216		0.0019	0.035	0.00025	0.00025	0.0014	0.35	0.0005	0.0010	0.040	0.0014	0.00038	0.0005
100% Scherrer 1 OSC -7-DAY	4%	9.66	7	5.92	0.0317		0.0030	0.017	0.00025	0.00025	0.0036	0.35	0.0003	0.0010	0.040	0.0032	0.00088	0.0005
100% Scherrer 1 OSC -14-DAY	4%	10.23	14	8.08	0.0352		0.0035	0.011	0.00025	0.00025	0.0018	0.35	0.0003	0.0010	0.040	0.0026	0.00072	0.0005
100% Scherrer 1 OSC -28-DAY	4%	10.12	28	19.92	0.0365		0.0039	0.035	0.00025	0.00025	0.0014	0.35	0.0004	0.0010	0.040	0.0027	0.00073	0.0005
100% Scherrer 1 OSC -42-DAY	4%	10.6	42	22.08	0.0366		0.0038	0.011	0.00025	0.00025	0.0011	0.35	0.0004	0.0004	0.040	0.0023	0.00054	0.0005
100% Scherrer 1 OSC -49-DAY	4%	10.26	49	26.92	0.0252		0.0029	0.035	0.00025	0.00025	0.0006	0.35	0.0002	0.0010	0.040	0.0017	0.0003	0.0005
100% Scherrer 1 OSC -63-DAY	4%	10.22	63	36.08	0.0309		0.0037	0.035	0.00025	0.00025	0.0009	0.35	0.0003	0.0010	0.040	0.0022	0.00035	0.0005

**Table 1:
EPA Method 1315 Diffusion Testing Results**

SAMPLE	Cement	pH	Time (Total Days)	Time (Step Days)	Antimony		Arsenic	Barium	Beryllium	Cadmium	Chromium	Fluoride	Lead	Mercury	Nickel	Selenium	Thallium	Uranium
					14-63 Day	Average												
100% Scherrer 1 OTC 2018 -2-HR	4%	8.8	0.08	0.08	0.0020		0.0004	0.035	0.00025	0.00025	0.0020	0.35	0.0001	0.0010	0.040	0.0005	0.0005	0.0005
100% Scherrer 1 OTC 2018 -1-DAY	4%	9.5	1	0.92	0.0067		0.0007	0.012	0.00025	0.00025	0.0009	0.35	0.0002	0.0010	0.040	0.0013	0.00019	0.0005
100% Scherrer 1 OTC 2018 -2-DAY	4%	9.38	2	1.08	0.0063		0.0007	0.035	0.00025	0.00025	0.0007	0.35	0.0001	0.0010	0.040	0.0010	0.00012	0.0005
100% Scherrer 1 OTC 2018 -7-DAY	4%	9.25	7	5.92	0.0091		0.0012	0.019	0.00025	0.00025	0.0015	0.35	0.0002	0.0010	0.040	0.0024	0.00027	0.0005
100% Scherrer 1 OTC 2018 -14-DAY	4%	10.01	14	8.08	0.0097		0.0014	0.012	0.00025	0.00025	0.0009	0.35	0.0003	0.0010	0.040	0.0018	0.00024	0.0005
100% Scherrer 1 OTC 2018 -28-DAY	4%	9.8	28	19.92	0.0104		0.0015	0.035	0.00025	0.00025	0.0009	0.35	0.0003	0.0010	0.040	0.0019	0.00025	0.0005
100% Scherrer 1 OTC 2018 -42-DAY	4%	10.33	42	22.08	0.0111		0.0017	0.013	0.00025	0.00025	0.0007	0.35	0.0003	0.0004	0.040	0.0016	0.00017	0.0005
100% Scherrer 1 OTC 2018 -49-DAY	4%	10.15	49	26.92	0.0075		0.0012	0.035	0.00025	0.00025	0.0020	0.35	0.0002	0.0010	0.040	0.0015	0.0001	0.0005
100% Scherrer 1 OTC 2018 -63-DAY	4%	10.1	63	36.08	0.0092	0.0096	0.0014	0.035	0.00025	0.00025	0.0006	0.35	0.0002	0.0010	0.040	0.0017	0.00011	0.0005
Previous/Current																		
					117		0	0	0	1	0	0	6	0	0	0	1	NA
					263		0	0	0	1	0	0	22	0	0	0	1	NA
					0.0043	0.0057	0.0011	0.0349	0.0003	0.0002	0.0017	0.3478	0.0033	0.0010	0.0267	0.0009	0.0004	
					0.006	0.006	0.05	2	0.004	0.005	0.1	4	0.05	0.002	0.1	0.05	0.002	NA
NOTES																		
1: All measurements not detected at the tabulated value, which may be either the detection limit or the reporting limit, shown in blue.																		
2: All measurements that exceed AWQS values are highlighted in red.																		
3: All concentrations as mg/L except pH.																		

Table 2:
Acid-Base Accounting--Raw Tailings

Lithologic Unit	Raw Tailings Sample Name (1)	Net Neutralization Potential (NNP)	NAG pH	Production Estimate (2)	Average NNP Each Type (3)	WEIGHTED NNP (4)
Concha 1	CONCHA 1 MC 2021	-45.6	5.4	23.55%	89.5	21.1
Concha 1	CONCHA 1 OSC	178	8.7			
Concha 1	CONCHA 1	136	9			
Concha 2	CONCHA 2 MC 2022	92.3	9	33.68%	159.7	53.8
Concha 2	CONCHA 2	227	10.1			
Concha 2 Deep	DEEPS MC 2021	279	10.4	0.01%	279.0	0.0
Epitaph 1	EPITAPH 1 COMP 3 2021	-141	2.2	21.16%	142.8	30.2
Epitaph 1	EPITAPH 1 MC 2021	185	10.6			
Epitaph 1	EPITAPH 1 OSC	333	10.2			
Epitaph 1	EPITAPH 1	194	10.6			
Epitaph 2	EPITAPH 2 MC 2022	554	10.9	0.10%	554.0	0.6
Hardshell Volcanics	HSV MC 2022	-331	2.4	4.67%	-331.0	-15.5
Hardshell Volcanics polymictic member	JHHZ MC MC 2022	-133	2.5	0.50%	-133.0	-0.7
Older Volcanics	OLD VOL MS 2022	-152	8.6	11.34%	-152.0	-17.2
Scherrer 1	SCHERRER 1 MC 2021	134	9	5.51%	161.5	8.9
Scherrer 1	SCHERRER 1 OSC	189	9.4			
Scherrer 2	SCHERRER 2 MC 2022	264	10.7	0.10%	264.0	0.3
	NNP OVERALL	115	8	100.62%		81.4

NOTES:

- 1: The sample names correspond to the cemented cylinder sample that was created from the raw tailings.
- 2: Production estimate is the overall percentage of tails anticipated to come from each lithology.
- 3: Average NNP is the arithmetic average of all tailings from the same lithologic unit, if there are multiple samples. For example, three cylinders were prepared with Concha 1 raw tails.
- 4: Weighted NNP is the average NNP for a given lithology multiplied by the projected percentage of the total volume of tailings. At the bottom of the column, these individual values are added to produce the resultant, overall NNP.
- 5: that the NNP for the raw tails can show variability as I understand they were each produced from a separate metallurgical bench test that may have had varying efficiencies of ore recovery/flotation.