



STATE OF
COLORADO

Cazier - DNR, Tim <tim.cazier@state.co.us>

Addendum to Response to DRMS Technical Revision TR-10 Adequacy Review - Holcim Portland Plant, Florence CO

1 message

Peters, Chris <Chris.Peters@arcadis-us.com>

Tue, Feb 17, 2015 at 3:22 PM

To: "tim.cazier@state.co.us" <tim.cazier@state.co.us>

Cc: "Joel Bolduc (joel.bolduc@holcim.com)" <joel.bolduc@holcim.com>, "lamanna, joe" <joe.lamanna@holcim.com>, "Yusko, Lauri" <Lauri.Yusko@arcadis-us.com>

Mr. Cazier,

Per your correspondences with Justin Andrews late last year, ARCADIS on behalf of Holcim has prepared this letter as an addendum to our November 19, 2014 letter, which was prepared in response to the DRMS' Technical Adequacy Review of Holcim's request to remove sodium as a monitoring parameter at the Portland Plant Quarry, Permit No. M-1977-344. As you may recall Holcim requested and was granted an extension until February 28, 2015 for the DRMS decision on the request.

The letter summarizes the results of an additional sampling round from December 2014 at monitoring well MW-7.

We look forward to your final decision on the request. Please contact me with any questions or concerns. My contact information is below.

Regards,

Chris

Christopher Peters | Vice President | chris.peters@arcadis-us.com

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Mr. Timothy A. Cazier, P.E.
Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, Colorado 80203

Subject:

Addendum to Response to DRMS Technical Revision (TR-10)
Preliminary Adequacy Review
Holcim (US) Inc. Portland, Colorado Limestone Quarry, Permit No. M-1977-344

Dear Mr. Cazier:

ARCADIS has prepared this letter on behalf of Holcim (US) Inc. (Holcim) to provide supplemental information to that provided to you in our November 19, 2014 response to the Division of Reclamation, Mining and Safety (DRMS) Technical Revision (TR-10) Technical Adequacy Review of the "Proposal to Remove Sodium as a Groundwater Quality Parameter – DRMS Permit No. M-1977-344, Technical Revision No. 6", dated August 4, 2014 and received by DRMS on October 20, 2014. The DRMS responded to the above proposal in a letter to Justin Andrews of Holcim dated October 31, 2014, requesting additional information be provided before they would authorize the removal of sodium as a water quality parameter to evaluate potential impact from leaching of cement kiln dust and alkali bypass dust (collectively referred to as CKD). That information was subsequently submitted in the November 19 correspondence. In addition, Holcim requested an extension on the DRMS' decision date for the Technical Revision to February 28, 2015. Finally, Holcim indicated at that time that an additional sampling event for monitoring well MW-7 would be conducted in December 2014 to support the findings and conclusions presented in the November 19 submittal.

The purpose of this letter is to present those results to you in support of our recommendations contained in the November 19 letter.

Imagine the result

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Date:
February 17, 2015

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Our ref:
B0025510.2014

December 2014 MW-7 Groundwater Sampling

Results of the December 16, 2014 groundwater samples collected from MW-7 are provided in the attached Table 1. For comparison purposes, the March 2014 sampling results are also included. The results of the December 2014 sampling further support the conclusion that increasing concentrations of sodium in groundwater samples collected at MW-7 are not associated with the CKD landfill. There continues to be a direct correlation between depth to water and sodium concentration. Note on Table 1 that the sodium concentration in well MW-7 dropped slightly between March and December 2014, from 253 to 245 mg/L. There is a corresponding decrease in depth to water (i.e. an increase in groundwater elevation) in the well. This is consistent with the pattern observed since groundwater monitoring began at the well in 1998. (Please note that the November 19 letter to you contains an error. On page 2, paragraph 2, line 7, the sentence states "The graphs demonstrate that while sodium concentration increase with increasing depth to groundwater, sulfate and *sodium* (italics added) concentrations are inversely related to groundwater depth". The italicized sodium should be potassium. We apologize for the error).

In addition to the regular monitoring parameters, chloride was analyzed in MW-7 for the December 2014 event. The chloride concentration was 63.3 mg/L (see Table 1), which, while higher than the historical concentrations of chloride in MW-7 (see Table 2), is in the same order of magnitude. As presented in our November 19 letter and summarized in Table 2, the average chloride concentrations in the alkali bypass dust generated at the Portland plant are greater than the sodium concentration in the dust by a factor of nearly 20, and the Synthetic Precipitation Leaching Procedure (SPLP) concentrations in the Portland bypass dust show a similar ratio (Cl:Na concentration ratio of approximately 29). Because chloride, sodium and potassium are all highly leachable, it is expected that the ratios of chloride, sodium and potassium should be relatively similar to that in the bypass dust, if the concentrations observed in MW-7 were due to impacts from the CKD landfill. In fact, the ratio of Cl:Na in the MW-7 sample from December was approximately 0.3. As such, these data indicate that the concentrations observed in MW-7 are not attributable to the CKD landfill.

Furthermore, the potassium to sodium (K:Na) ratio in the December sample was 0.04, which is again not consistent with the expected K:Na ratio, if CKD was impacting the water in the well. As demonstrated in our November 19 letter and shown in Table 2, potassium concentrations in the alkali bypass dust generated from the Portland plant are significantly greater than sodium concentrations.

Because the sodium concentration in groundwater collected from MW-7 on December 16, 2014 exceeds the DRMS compliance standard, ARCADIS recommends that a groundwater sample be collected from MW-7 during the March 2015 annual sampling event of the water column before purging the well dry and analyzing for sodium and chloride. This may further support the hypothesis that when the depth to groundwater increases the proportion of groundwater that may be contributed from the shale increases and may result in the observed shifts in groundwater quality with increased depth to groundwater. The "after purge" analyte list for MW-7 will remain the same as the annual sampling event.

Summary and Recommendations

The data collected during the December 2014 sampling event further demonstrate that sodium concentrations are not a reliable indicator of impacts from CKD. Potassium concentrations and the potassium to sodium concentration ratio are more useful for this purpose. We recommend eliminating the Numerical Protection Limit (NPL) for sodium, but continue to monitor groundwater samples for sodium.

If the DRMS has additional questions or concerns about the suggested monitoring approach, we would be willing to meet to further discuss this issue. Please let us know whether you believe a meeting would be appropriate, and if so, please suggest a convenient meeting date.



Mr. Timothy A. Cazier
February 17, 2015

We look forward to your response. Please contact me at 517.324 5052 (office) or 517.927.3611 (cell) if you have any questions.

Sincerely,

ARCADIS U.S., Inc.

A handwritten signature in black ink, appearing to read "Chris S. Peters".

Christopher S. Peters, CPG
Vice President

Tables:

Table 1 MW-7 Sampling Results - Portland Plant

Table 2 Historical Cl, K, and Na Concentrations in Monitoring Well MW-7,
SPLP, and Alkali Bypass Dust

Copies:

Joe Lamanna, Holcim (US) Inc.

Joel Bolduc, Holcim (US) Inc.

Lauri Yusko, ARCADIS

Julie Sueker, ARCADIS

File

Tables

Table 1
MW-7 2014 Sampling Results
Holcim (US) Inc.
Portland Plant, Florence, Colorado

Analyte		MW-7	March - 2014		Dec - 2014
Field Parameters	Units	NPLs	MW-7		MW-7
pH	std. units	6.5-8.5 ^a	7.55		7.61
Specific Conductivity	mS/cm	NA	2.792		1.637
Temperature	°C	NA	14.0		14.69
Depth to Water	feet BTOC	NA	25.3		24.22
Laboratory Results					
Chloride	mg/L	250 ^a	NAn		63.3
Total dissolved solids	mg/L	3918	2620		NA
Sulfate	mg/L	2080	1460		787
Iron (total)	mg/L	NA	3.45		2.58
Iron (dissolved)	mg/L	4.5	0.04	B	U
Manganese (dissolved)	mg/L	0.88	0.059		0.012
Potassium (dissolved)	mg/L	17	12.1		9.5
Sodium (dissolved)	mg/L	226	253		245

Notes:

NPLs - numeric protection levels issued by Division of Reclamation, Mining and Safety

BTOC - Below top of casing.

Bolded and shaded values - Screening level exceeded

U - The material was analyzed for, but was not detected above the level of the associated value.

The associated value is either the sample quantitation limit or the sample detection limit.

B - Analyte concentration detected at a value between Method Detection Limit and Practical Quantitation Limit. The associated value is an estimated quantity.

NA - Not available.

NAn - Not analyzed.

^a Standard is from: Table 2 - Domestic Drinking Water Standards, CDPHE Water Quality Control Commission Regulation 41.

**Table 2. Historical Cl, K, and Na Concentrations in Monitoring Well MW-7,
SPLP, and Alkali Bypass Dust
Holcim (US) Inc. Portland Plant, Florence , Colorado**

Date	MW-7 (mg/L)			Cl:Na	K:Na
	Cl	K	Na		
9/11/1998	32.6	17	112	0.29	0.15
11/30/1999	26.5	13	144	0.18	0.09
5/5/2000	29.4	15.6	185	0.16	0.08
8/11/2000	25.9	16	164	0.16	0.10
11/7/2000	27.2	12.8	161	0.17	0.08
2/8/2001	27.6	11.2	177	0.16	0.06
5/21/2001	28.1	11.1	186	0.15	0.06
8/7/2003	25.0 J	11	170	0.15	0.06
3/1/2008	37	10.4	226	0.16	0.05
4/1/2009	42	7.2	236	0.18	0.03
12/16/2014	63.3	9.5	245	0.26	0.04

	Bypass Dust SPLP (mg/L)			Cl:Na	K:Na
	Cl	K	Na		
11/14/2002	4600	NAn	158	29.11	

	Bypass Dust Compositional Conc.(wt.%)			Cl:Na	K:Na
	Cl	K	Na		
2014	8.1	5.14	0.43	18.84	11.95

Note: The dates selected are when Cl, K, and Na were all analyzed. No Cl data are available between 2009 and 2014

J- concentration below reportable limit but above method detection limit

BTOC - below top of casing

NAn - Not analyzed