

ATTACHMENT 1

May 31, 2024

Confidential Business Information Redacted

Mr. Michael B. Leat
Iowa Department of Natural Resources
Land Quality Bureau
502 East 9th Street
Des Moines, Iowa 50319

**RE: Continental Cement Davenport Plant CKD Landfill
Response to Comments – 2023 Annual Water Quality Report (AWQR; doc #108360)
301 East Front Street
Buffalo, Iowa
Permit #82-SDP-16-97P**

Dear Mr. Leat:

Blackstone Environmental, Inc. (Blackstone) received the Iowa Department of Natural Resources (IDNR) letter dated April 25, 2024, regarding their review of the 2023 Annual Water Quality Report (AWQR) dated November 30, 2023 prepared by Blackstone. The letter requests a response by May 31, 2024. With this transmittal, Continental timely submits its response. For ease of reference, IDNR's comments are provided in *italicized* text and our responses are provided following each comment in **bold** text.

- 1. Please be reminded that the Maximum Contaminant Level for fluoride is 4 mg/L and make the appropriate table corrections in future reports as necessary.*

Blackstone has modified Tables 5A, 5B, and 6 in the 2023 AWQR to include the Maximum Contaminant Level (MCL) for fluoride, and the updated tables are provided with this letter. Future reports will contain the updated MCL for fluoride.

- 2. In DNR's August 15, 2018 and April 2, 2019 letters (doc #92946 and doc #94792) we required that the permit holder to submit maps that clearly depicted the boundaries of the Phase I and II disposal areas. Please ensure that these boundaries are depicted on future maps.*

Blackstone will include the boundaries of the Closed Cell, Closed Phase I Cell, and Active Phase II Cell for the Cement Kiln Dust (CKD) disposal areas on future maps and figures.

3. *Since the LL-3 lysimeter was sampled during the last two sampling events, please include the water quality data from that sampling point in future time versus concentrations graphs.*

Lysimeter LL-3, which is located in the active CKD monofill and intended to monitor liquid thickness and vertical leakage through the bottom liner system or groundwater encroachment below the liner system, is monitored during each semi-annual groundwater sampling event. It has historically been dry during leachate and groundwater monitoring events. The LL-3 location was observed to contain enough liquids to obtain a sample during the fall 2022 and fall 2023 monitoring events. LL-3 was observed to not contain liquids during the spring 2023 monitoring event. As noted in the 2023 Leachate Control System Performance Evaluation Report¹, reliable trends cannot be made on two data sets. Future Time Versus Concentration Plots will include the two historical data points for the LL-3 monitoring location and future monitoring events when a sample is obtainable.

4. *DNR required the completion of a Groundwater Remedial Action Mitigation Plan (RAMP) in our September 9, 2020 letter (doc #98407). Two of the required RAMP components were to include a flexible membrane liner with more efficient leachate drainage layer in future disposal cells and closure of the current disposal area with an improved final cover.*

Based on the 2023 data, the active Phase 2 disposal cell continues to allow a problematic level of leachate exfiltration through the liner as evidenced by contamination in lysimeters LL-2 and LL-3. Historical high concentrations of at least 18 separate contaminants that also exceeded background and/or published standards, were noted in one or both of the lysimeters in 2022 or 2023. Additionally, the lysimeter for the closed Phase 1 cell LL-1 continues to exhibit very elevated pH (12.88 in September 2023), in addition to other contamination, which is also indicative of CKD leachate exfiltration through the overlying liner.

This data, along with the ongoing groundwater contamination, further supports the need for Continental to hasten steps to eliminate landfilling cement kiln dust (CKD) in the existing disposal cells to allow for existing cell closure and future CKD disposal in a modern lined cell.

After DNR discussions with Continental regarding your ongoing investigations into reuse alternatives to CKD disposal, we agreed to place the above requirements on hold to allow time to see if those reuse investigations could be expected to result in the elimination of CKD disposal at the site in our letter dated June 28, 2022 (doc #103499). After our review of your recent summaries of those reuse investigations, it is unclear if those investigations can be expected to result in the DNR's goal of the elimination of CKD landfilling in the currently-approved disposal cell within a reasonable timeframe.

¹ The Leachate Control System Performance Evaluation Report is Appendix F to the 2023 AWQR (Doc. #108360).

Therefore, in order to help us further evaluate the continuation of the currently-approved approach, we are requiring that you submit the following information:

- a) Quantities of all CKD landfilled each year from 2020 through 2023,*
- b) Quantities of all CKD beneficially reused each year from 2020 through 2023,*
- c) A listing of the CKD quantities that could reasonably be utilized by the remaining reuse options as described in bulleted items #3, #4, and #5 in the Spring 2024 semiannual engineering inspection report (doc #109884),*
- d) Any other prospective options being investigated with potential CKD quantities, and*
- e) A Gantt chart (or similar) that shows anticipated end dates for any investigations covered by items b) and c).*

Please also note that the DNR considers this work as a key component of the RAMP. Therefore, it is imperative that Continental consider it as such, which includes listing a description of the status of these investigations in the RAMP update included in each AWQR.

Please also be aware that unless your response provides a reasonable pathway towards meeting our goal of the timely elimination of CKD disposal in the current disposal cell, we intend to reinstate the prior permit requirements for landfill redesign and existing cell closure as originally described in DNR's September 9, 2020 NOV (doc #98407).

Continental claims that some of the information provided in response to Question 4 below is confidential, and requests that IDNR treat it confidentially in accordance with 561 IAC 2.5(7)"c." Continental is submitting a Confidentiality Request with this response that substantiates its claim of confidentiality. See Attachment 2.

Continental has two overarching responses to IDNR's comments. First, Continental disagrees with IDNR's position regarding the source of the contamination. We have been steadfast in this position for the last three years. Second, nevertheless, Continental remains committed to compliance and has taken significant and quantifiable steps toward eliminating (or greatly reducing) landfilled volumes of CKD.

Linwood's Contribution

On Continental's behalf, Blackstone has raised questions about the impact of Linwood's contributions to Continental's groundwater multiple times with escalating levels of specificity during the last three years.² For ease of reference, examples from Continental's AWQRs, RAMP, January 7, 2022 letter, May 12, 2022, letter, and Leachate Control System Evaluation Reports submitted to the IDNR are included below to provide context and support for the statements in this letter:

² Continental's investigation of Linwood's contribution is ongoing as part of its litigation against Linwood.

January 7, 2022 Continental Response to Comments on Revised Site Operations Plan (Doc. #101987)

- “The stope is in rooms that are approximately 40 feet wide by 20 feet high. . . . Water has accumulated in the area between depths of approximately 80 to 100 feet below ground surface (bgs). The stope system may be connected hydraulically to Lafarge’s (now Continental’s) quarry area and the water collecting in the stopes appeared to drain into Lafarge’s (now Continental’s) quarry sump.”
- “Blackstone’s investigations, including the recently submitted Annual Water Quality Report (AWQR), appear to indicate that the fly ash and limestone products slurry being disposed of in the stopes, lime kiln exhaust gases being vented into the stopes, or both, may be creating a reducing environment in the subsurface that is mobilizing constituents from bedrock that would normally remain immobile within the bedrock.”

Revised 2021 Annual Water Quality Report, dated March 31, 2022 (Doc. #102703)

- “MW-2CR is located within an undermined (stope) area associated with the neighboring Linwood mine. Exceedances of primary MCLs or SWS at groundwater sampling point MW-2CR included fluoride, nitrate, arsenic, boron, lead, lithium, manganese, molybdenum, nickel, and vanadium. Of those constituents that exceeded MCLs or SWS at multiple monitoring points, the concentration of arsenic, lithium, molybdenum, and vanadium were higher at monitoring point MW-2CR than concentrations in other monitoring points or sumps during the September 2021 monitoring event at the Continental Facility. This information suggests that these constituents may be originating from the area of MW-2CR.”
- “Mining occurring both on and off-site may be causing changes to the groundwater chemistry, mobilizing naturally occurring elements, such as metals, that would otherwise be stable in the subsurface. The disruption to natural physical and chemical reactions could subject the subsurface to increased oxidation and precipitation as a result of weathering. For example, reducing conditions within the groundwater system can result in the mobilization of naturally occurring metals. Blackstone recommends that field parameters including DO and ORP be measured in the field so that these reactions can be more accurately assessed.”

May 12, 2022 Request from Continental for Meeting to Discuss Groundwater Remedial Action/Mitigation Plan and Updated Landfill Design (Doc. #103222)

- “Based on analytical results from the groundwater monitoring and field measurements, it appears that impacts to groundwater may be emanating from the adjacent Linwood mine. Evidence gathered that indicates this is the case is the following:
 - During the Spring 2022 groundwater sampling, field measurements of dissolved oxygen (DO) and oxidation-reduction potential (ORP) were collected. The field measurements indicated reducing conditions across the Site. ORP measurements ranged from -242.5 mv in

monitoring well MW-11 to 41.2 mv in leachate monitoring point LL-2. DO measurements ranged from 12.90 mg/L in the Q-Sump to 0.22 mg/L in monitoring well MW-12.

- During the Spring 2022 groundwater sampling, pH was measured in the field. The field measurements indicate lower (i.e., more acidic) to circumneutral pH measurements north and east of the monofill area (6.78-7.82 SU). Higher (i.e., more basic) pH measurements are observed south of the monofill in the central portion of the Site (10.95-11.36 SU). Circumneutral pH is often maintained by the dissolution of sedimentary carbonates. A review of pH values across the site indicates that pH buffering may be occurring.
- In general, metals concentrations are higher in the stope well, MW-2CR, than in the groundwater or leachate monitoring samples.
- A sample of the CKD material was submitted to the laboratory for analysis of total arsenic, cobalt, lithium, manganese, and molybdenum. Arsenic, lithium, and molybdenum were non-detect (<9.65 milligrams per kilogram [mg/kg], <24.1 mg/kg, and <9.65, respectively). Concentrations of cobalt and manganese were detected at concentrations of 13.0 mg/kg and 2,770 mg/kg, respectively. Synthetic Precipitation Leaching Procedure (SPLP) analysis was also conducted for the same constituents on the CKD sample. The SPLP analytical results were non-detect for the metals. This analysis suggests that the CKD is not the source of impacts to groundwater.”
- “As indicated in the permit dated January 6, 2022, and updated on April 20, 2022, IDNR is requiring updated landfill design plans that include closure and/or hydraulic isolation of the current disposal area due to the identified impacts to groundwater. As indicated above, the impacts appear to be from an off-site source. Therefore, preparing and implementing an updated landfill design plan that addresses the closure and/or hydraulic isolation of the current disposal area is not likely to have an effect on mitigating existing and future impacts to groundwater observed at the Site.”

Revised Leachate Control System Performance Evaluation Report, dated May 20, 2022 (Doc. #103263)

- “Some constituents such as chloride, potassium, selenium, sodium, and total dissolved solids are present at higher concentrations in the L-Sump, LL-1, and LL-2 monitoring points than nearby groundwater monitoring wells (MW-1A, MW-1B, MW-5 and MW-12). Comparison of these constituent concentrations could be indicative of leachate present within the LL-1 and LL-2 monitoring points since the highest concentration on-site is generally found in the L-Sump samples followed by the LL-1 and LL-2 monitoring points and the groundwater wells exhibiting the lowest concentrations. However, it should be noted that the elevated concentrations of these constituents are also present in monitoring well MW-2CR, which is located in the stope area associated with Linwood’s operations, at concentrations similar to or greater than those in the L-Sump. Time series plots showing this data are included in Appendix C.”

- “LL-3 monitoring data has historically been dry and was not observed to contain liquids during the 2021 monitoring events. Thus, LL-3 readings do not indicate vertical leakage or groundwater encroachment conditions are occurring at this location.”

Groundwater Remedial Action Mitigation Plan (RAMP), dated May 31, 2022 (Doc. #103289)

- “The 2021 groundwater analytical results appear generally consistent with historical results. Plume maps indicate two distinct source areas – one centered on stope monitoring well MW-2CR and another along the toe of the Landfill in the area of monitoring wells MW-4, MW-4L, MW-18, and MW-14.”
- “Monitoring well MW-2CR is located within an undermined (stope) area associated with the neighboring Linwood mine. Liquids from MW-2CR were sampled on October 8, 2021 and again on March 19, 2022. A sludge sample was also recovered using a bailer during the March 19, 2022 event. Exceedances of primary MCLs or SWS at groundwater sampling point MW-2CR include fluoride, nitrate, arsenic, boron, lead, lithium, manganese, molybdenum, nickel, and vanadium. Of those constituents, the concentration of boron, molybdenum, and vanadium were higher in the MW-2CR liquid sample than the leachate sump (L-Sump) or leachate monitoring points. The concentration of arsenic, lead, lithium, manganese, molybdenum, nickel, and vanadium in the sludge was higher than those observed in either the MW-2CR liquid sample or from the L-Sump. While it is expected that metals concentrations would be higher in a sludge/sediment sample, this information suggests that select metals may be originating, at least in part, from the stope area.”
- “The SPLP data suggests that the leaching potential of the CKD and sludge material and its potential contribution to the leachate and surrounding groundwater is generally low; however, concentrations of lithium, manganese, and molybdenum were measured in the MW-2CR sludge material and in the case of molybdenum at similar concentrations to that observed in the L-Sump. Total metals data shows higher concentrations of molybdenum in the MW-2CR sludge sample as compared to the CKD; similar concentrations of lithium and in the CKD and sludge sample; and higher concentrations of cobalt and manganese in the CKD sample. This data suggests that the discrete source areas are likely contributing variable concentrations of specific metals to the groundwater.”
- “Site hydrogeology has been extensively disturbed by mining operations occurring both on and off-site to the east of the facility. Mining operations are documented to cause alterations to groundwater geochemistry including elevated pH, conductivity, calcium, and sulfate. Review of available data suggests secondary geochemical impacts to the Site due to mining operations occurring both on and off-site are occurring. Review of historical and existing groundwater levels and contours indicates the disturbance has impacted groundwater flow and gradient. Underground pumping and dewatering occurring off-site to the east is likely responsible for a reduction in groundwater levels and on-site wells being intermittently low or dry. As a result, metals and compounds that are otherwise stable under saturated

conditions can be precipitated and deposited when exposed to oxygen as groundwater levels fluctuate.”

- “Mining occurring both on and off-site is likely causing changes to the groundwater chemistry, mobilizing naturally occurring elements, such as metals, that would otherwise be stable in the subsurface. The mining process exposes bedrock to weathering and recharge that would not normally occur in the absence of these operations. The disruption to natural physical and chemical reactions subjects the subsurface to increased oxidation and precipitation as a result of weathering. For example, reducing conditions within the groundwater system can result in the mobilization of naturally occurring metals that would otherwise be stable.”

2023 Annual Water Quality Report, dated November 30, 2023 (Doc. #108360)

- “MW-2CR is located within an undermined (stope) area associated with the neighboring Linwood mine. Exceedances of primary MCLs or SWS at groundwater sampling point MW-2CR included arsenic, boron, cadmium, cobalt, lead, lithium, manganese, molybdenum, nitrate, nitrite, nickel, selenium, thallium, and vanadium. The concentrations of arsenic, boron, cadmium, cobalt, lithium, molybdenum, and vanadium were typically higher at monitoring point MW-2CR than concentrations in any other monitoring points during the 2023 monitoring events at the Continental Facility. This is consistent with observations in 2021 and 2022 and suggests that these constituents originate from the area of MW-2CR.”

Leachate Control System Performance Evaluation Report, dated November 30, 2023 (Appendix F in Doc. #108360)

- “Monitoring points LL-1 and LL-2 have various constituents that are similar in concentration or show no consistent signs of higher or lower concentrations between the evaluation points. In general LL-1 and LL-2 have more constituents that exhibit lower concentrations when compared to the L-Sump monitoring data.”
- “Some constituents such as chloride, potassium, selenium, sodium, and total dissolved solids are present at higher concentrations in the L-Sump, LL-1, and LL-2 monitoring points than nearby groundwater monitoring wells (MW-1A, MW-1B, MW-5 and MW-12). Comparison of these constituent concentrations could be indicative of leachate present within the LL-1 and LL-2 monitoring points since the highest concentration on-site is generally found in the L-Sump samples followed by the LL-1 and LL-2 monitoring points and the groundwater wells exhibiting the lowest concentrations. However, it should be noted that the elevated concentrations of these constituents are also present in monitoring well MW-2CR, which is located in the stope area associated with Linwood’s operations, at concentrations similar to or greater than those in the L-Sump. Time series plots showing this data are included in Appendix B.”
- “LL-3 monitoring data has historically been dry and was not observed to contain liquids during the spring 2023 leachate and groundwater monitoring events. A sample was obtained from LL-3 during the fall 2023 monitoring

event and represents two points of data from this location with the inclusion of the fall 2022 monitoring event. Reliable trends cannot be made on two data sets. If additional samples are obtained during 2024, then a trend evaluation of the data will be performed regarding vertical leakage or groundwater encroachment conditions potentially occurring at this location.”

- “Comparing prior monitoring data to the 2023 results shows relatively similar conditions over the past few years and does not appear to represent a significant change in site conditions occurring during 2023.”

With respect to the pH of 12.88 at LL-1 in September 2023, Continental notes that Linwood's lime kiln dust (LKD) has a pH of 12.5 at 25°C.³ Thus, the level of pH at LL-1 is consistent with LKD, too.

To summarize, Continental remains committed to pursuing solutions to limit, and if possible eliminate, the landfilling of CKD in the current disposal cell. These efforts are quantified below. Consistent with our concerns above, in our technical opinion, impacts to groundwater appear to be from off-site sources, namely Linwood Mining and Materials Corp. (Linwood). Continental maintains its position that without addressing Linwood's source of the contamination, it would be inefficient and, ultimately ineffective, to prepare and implement an updated landfill design that addresses the closure of the current disposal area. The way to mitigate existing and future impacts to groundwater is to develop a comprehensive strategy, and that strategy starts with eliminating the source of the contamination coming from Linwood. We know IDNR has attempted to initiate these efforts and request continued support for a comprehensive solution.

Increases in CKD Reuse/Reduction in Landfilled CKD

As described in the RAMP, Continental has evaluated several options for reducing the amount of CKD landfilled at the facility. This information is broken down in response to IDNR's questions below. As you will see, Continental has significantly reduced the amount of CKD landfilled pursuant to the Landfill Permit. This is the result of internal reuse and beneficial reuse by third-parties. While these amounts will vary over time, Continental plans to continue limiting landfilled material to the extent feasible.

- a) The following table provides the quantities of CKD landfilled for each year requested, and shows that, in total, Continental actually reused or sent for reuse a higher volume of CKD than it generated in 2023. Continental will reuse as much freshly generated CKD onsite as possible moving forward, noting, however, that the volumes reused are dependent on the chemistry and makeup of the materials in the process. In addition, Continental continues to explore opportunities to eliminate landfilling freshly generated CKD onsite and to partner with companies that can remove already landfilled CKD for offsite reuse.

³ https://www.carmeuse.com/sites/default/files/2024-02/Carmeuse%20Americas_LKD_US-en_v2_0.pdf.

Year	Fresh CKD Generated (tons)	Fresh CKD Reused Onsite (tons)	Landfilled CKD Removed for Offsite Use (tons)	Net Amount of CKD Landfilled (tons)
2020	21,992		0	1,884
2021	24,834		0	2,531
2022	26,121		0	5,028
2023	29,049		837 ⁴	-62 ⁵

- b) For each year requested, the following table provides the quantities of CKD (1) beneficially reused onsite in Continental's operations and (2) excavated and removed from the active landfill by a vendor for its beneficial reuse of the material offsite. The table shows a significant increase in the quantities reused both onsite and offsite in 2023.

Year	Fresh CKD Reused Onsite (tons)	Landfilled CKD Removed for Offsite Use (tons)
2020		0
2021		0
2022		0
2023		837

- c) The Spring 2024 Semi-Annual Engineering Inspection Report (Doc. #109884) presented three options for reducing the volume of landfilled CKD, which IDNR refers to as Bulleted Items 3-5. Those options were:

- **Bulleted Item 3:** "Currently assessing other potential options for use of both fresh and landfilled CKD material. For freshly generated dust, an increase in the dust substitution rate to the finish mill has been achievable when chemistry requirements allow and continues to be performed."
- **Bulleted Item 4:** "Received approval from a company for their use of the fresh CKD in a product they create. This company has completed a trial study to determine the feasibility of using the landfilled CKD. The trial study went well, and a contract is under development for use of landfilled CKD."
- **Bulleted Item 5:** "In the process of gaining acceptance with a company for their use of the freshly generated dust. Continental is in the process of modifying the loadout system to allow fresh CKD to be placed into tanker truck. It is anticipated that in the future, trials will be performed

⁴ This is the amount of previously landfilled CKD removed by a customer as part of a trial study to determine whether the material can be used in its products or processes. The material was removed from the active landfill.

⁵ This is the net of the amount of fresh CKD landfilled in 2023 (775 tons) and the amount of previously landfilled CKD removed by a customer from the active landfill in 2023 for use in a trial study (837 tons).

using the landfilled CKD to determine the acceptability of use as an additive in the finish mill system.”

Continental notes that these items are being implemented in parallel. Below is the specific quantity information requested by IDNR by Bulleted Item:

Bulleted Item #3:

The amount of fresh CKD material that can be beneficially reused in the finish mill process is limited by the chemistry and makeup of the materials in the process. [REDACTED]

[REDACTED]. See Chart in #4.b above.

Bulleted Item #4:

Continental is currently negotiating a contract for the beneficial reuse of previously landfilled CKD. [REDACTED]

[REDACTED]

[REDACTED]

Continental will continue to identify other customers that may be interested in removing and reusing landfilled CKD. See response to Comment 4(e) below.

Bulleted Item #5:

Continental is working on modifying the loadout system for fresh CKD so it can be provided to customers directly rather than landfilling it onsite. Once this is achieved, it will be possible to load and deliver fresh CKD [REDACTED]

[REDACTED]

- d) The use of [REDACTED] is still a topic of interest and debate. [REDACTED] product. Continental also continues to source and evaluate additional options for new and existing CKD.
- e) The following provides an anticipated timeline of known opportunities for beneficial reuse of the CKD and ongoing investigations.

Opportunity / Investigation	Milestone	Date
Various firms for potential CKD reuse	Meetings / solicitations / etc.	Ongoing as opportunities arise
Aggregate product use by potential customer	Feasibility Testing	Completed
	Additional Testing	TBD
Continental [REDACTED]	Continued CKD reuse	[REDACTED]
Landfilled CKD Reuse by potential customer	Trial Testing	Completed
	Contract Execution	[REDACTED]
	CKD Use	[REDACTED]
Fresh CKD Reuse by potential customer	Modify Continental CKD Loadout System	Late-July 2024
	Trial Testing of landfill CKD	Late-2024 or Early-2025

5. Leachate Collection System Performance Evaluation Report (LCSPER). Several exceedances of the 12-inch maximum-allowed leachate head was measured multiple times during 2023 at UL-2R and UL-3R, which were installed in September 2022. This is very concerning, as we issued a Notice of Violation regarding this very issue on September 9, 2020 (doc #98407) due to this being a persistent issue since 2015.

Although the 2022 piezometer replacement allowed for the collection of reliable measurements, and there appeared to be some improvement of leachate head measurements immediately after line cleaning, numerous non-compliant measurements of leachate head remained at UL-2R and UL-3R in 2023 that indicate that the underlying problem with the leachate collection system is more substantial.

Therefore, it is DNR's position that fouling, precipitation, system failure or some other process has occurred during the decades of operation that adversely affected the efficacy of the leachate control systems (collection pipes or the granular drainage blanket), or that the system was under-designed or constructed to the extent that its operation no longer results in consistent compliance with the 12-inch maximum leachate head requirement of 567 IAC 115.26(11)"a"(1). We consider this to be further support for the DNR's goal for

timely closure of the existing disposal cells and redesigning future cells, as stated earlier in this letter.

Preliminarily, we note that less landfiling of CKD is not likely to significantly contribute to a change in liquid levels in the landfill. However, Continental has, and will continue, to work diligently to achieve and maintain compliance with the leachate head requirements established in the landfill permit.

We do not believe there are fouling or design issues with the landfill for a number of reasons. First, overall, the liquid head levels in the leachate collection system are below the 12-inch permit requirements most of the time, suggesting that the system is properly designed. In addition, liquid head levels have been shown to decrease after jetting of the collection piping, which indicates that the system is sufficient for removing liquids from the landfill. Furthermore, a portion of the leachate collection media was inspected during the replacement of the UL-2 and UL-3 monitoring points and observed to not be detrimentally impacted by biological growth or sediment buildup. We note that the leachate collection system runs off solar-power pumps that have more limited capabilities during the winter months due to less daylight. To combat this, Continental has purchased a backup generator that, once installed by the end of June 2024, will allow the pump to run more often.

Over the past several years, Continental has taken a number of actions aimed at reducing the header levels and to investigate the efficacy of the leachate control system more broadly. These are described below:

- **Installed transducers in leachate monitoring points UL-1, UL-2, UL-3, LL-1, LL-2, and MW-10 in June 2021 to accumulate consistent leachate level depth data for each monitoring point that has sufficient water depth;**
- **Calculated and verified the fall from the leachate monitoring points to the sump is adequate;**
- **Verified the pump located within the sump is the appropriate size and capacity;**
- **Calculated and verified the pumping rate is adequate for anticipated flow;**
- **Verified the system (pump, solar panels that power the sump, etc.) is working properly;**
- **Conducted a visual observation inside of the sump to verify pipe connections and flowing conditions;**
- **Inspected leachate monitoring points using a downhole camera;**
- **Replaced monitoring points UL-2 and UL-3;**
- **Inspected leachate drainage media for fouling during replacement of the UL-2 and UL-3 monitoring points; and**
- **Purchased a generator to power the pump in the event there is not enough daylight to activate the pump, which will be installed by the end of June 2024.**

In addition, Continental continues to jet the leachate pipes at least once a year to ensure they are free from obstructions.

Continental Cement
Buffalo, Iowa



Continental has concern regarding potential subsurface contribution of liquids into the CKD landfill that impact leachate levels. This concern is based on the relatively consistent liquid levels regardless of whether there was precipitation. Leachate pump cycle rates show roughly the same flow every day, even when there has not been precipitation for many days. As evidenced by the attached chart (Exhibit A), the groundwater levels dip and rise in a consistent pattern, regardless of precipitation, leading Blackstone to conclude that the groundwater is infiltrating from another source, which is likely water in the mine stope. Continental is still evaluating this issue to ensure that the corrective measures described above are adequate.

We appreciate your comments and are confident we have addressed the issues. If you would like to discuss further or need additional information, feel free to contact either of the undersigned.

Respectfully,

BLACKSTONE ENVIRONMENTAL, INC.

A handwritten signature in blue ink that reads 'Eric Sonsthagen'.

Eric Sonsthagen, P.E.
Senior Project Engineer

Attachments: Revised Tables 5A, 5B, and 6
Exhibit A