

Richard Healey (adpce.ad)

From: Charles McDowell <CMcDowell@lsbindustries.com>
Sent: Friday, March 8, 2024 12:14 PM
To: Richard Healey (adpce.ad); Water-Enforcement-Report
Cc: Keith Long; Howard Stevens
Subject: EDCC, NPDES Permit AR0000752
Attachments: 2023-24 Waste Water Data.xlsx; EDC Weekly Update 2024-3-8.docx

Mr Healey,
Attached is the weekly update with the effluent data.

If you have any questions, feel free to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

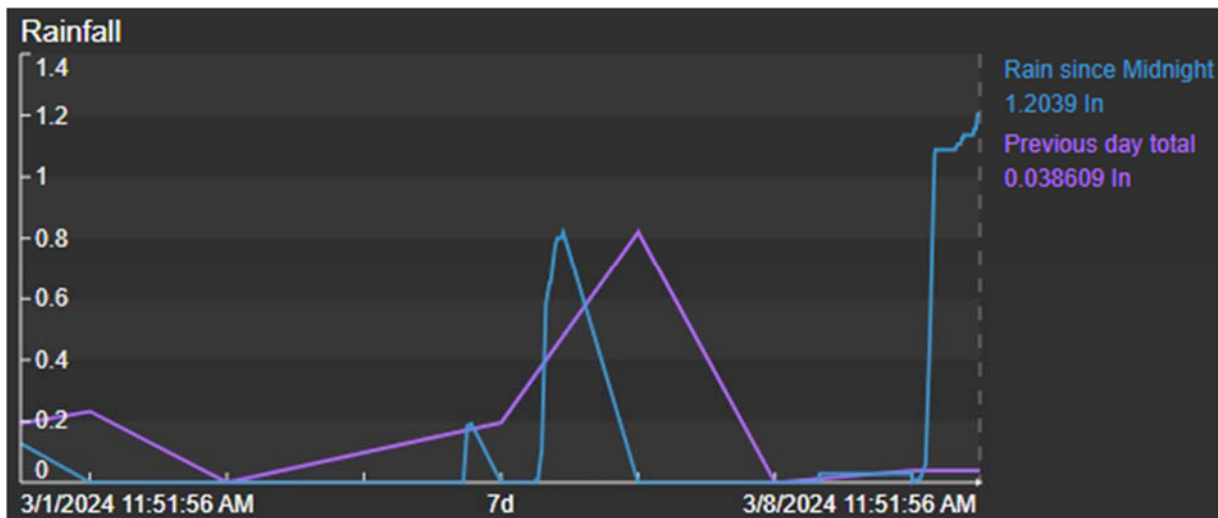
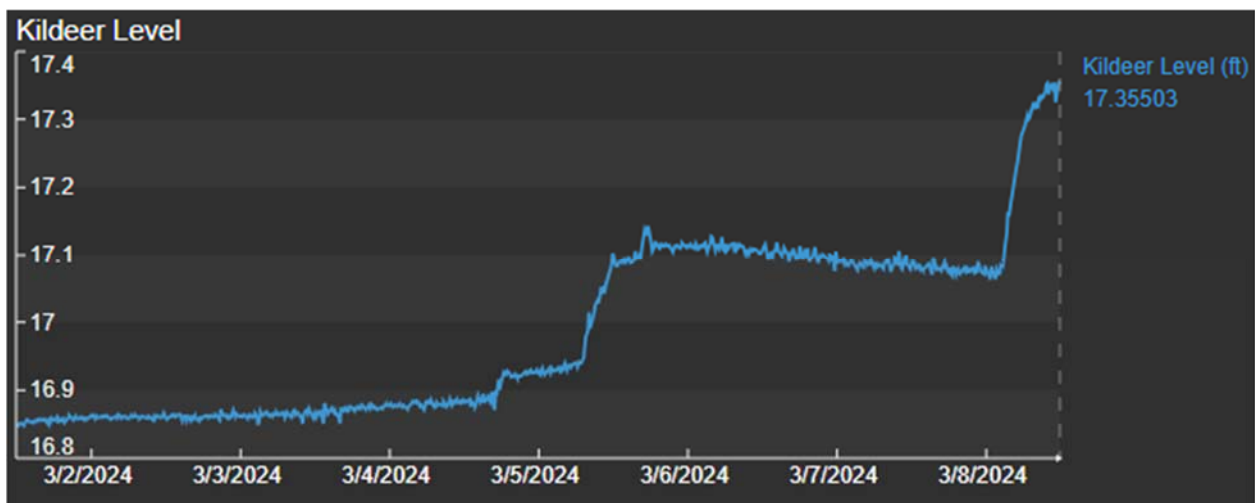
Weekly Report Required by Interim Measures Letter dated 8/4/2023

LSB Chemical Company, NPDES Permit Number: AR0000752, AFIN: 70-00040

Weekly Report Date: 8 March 2023, Updated portions are underlined.

Discharges and Implementation of Emergency Action Plan

Over the last week, the facility received 2.79 inches of rain. Lake Kildeer is currently at 17.35 feet and the discharge from Outfall 010 is 1.0 MDG until the 5th when we increase the discharge to 2.0 MGD. On the 8th we opened Outfall 001 to prevent overtopping the spillway. The forecast indicates that we will receive approximately 2.1 inches of rainfall over the next ten days. LSB is attempting to keep the levels of Kildeer below 17.00 feet. In the event of additional rain, LSB will manage the discharge from Kildeer as necessary to ensure water does not overtop the emergency spillway in accordance with the August 4, 2023 Interim Measures letter.



Conduct Daily Sampling of Lake Lee, Lake Killdeer, and Pond 004

LSB commenced this required sampling on August 5, 2023. Updated Information is in the attached 2023/2024 spreadsheet.

Provide Copies of Sampling of Lake Lee, Lake Killdeer, and Pond 004 Since January 1, 2023

Please see the LSB Interim Measures response dated August 9, 2023.

Corrective Action Plan Activities [updates from the previous week are underlined]

During our August 17th conference call we discussed that these proposed activities may trigger a communication to the ADEQ and possible permit changes. We will continue to communicate plans and improvements to obtain ADEQ's guidance on proper permitting.

Minimize Wastewater Contaminant Loading

Water Reuse:

LSB has evaluated its processes to assess locations where water can be reutilized in processes. Currently we are reusing as much wastewater as possible, that would otherwise flow into Pond 004, and are reusing some water from Pond 004 when the opportunity arises.

Minimize Wastewater Inflow

The stormwater diversion project has been completed. LSB met with ADEQ on the 19th to discuss permit applicability. Based on the discussions this action will not require a construction permit. Physical work on the project has been completed and we can now divert a total of 30% of the stormwater flow from 004. This is currently a manual process, to automate additional work will be required.

Additionally, we have started an engineering study to divert additional water away from the Ammonia Nitrate facility. This project will focus on paving in and around the Ammonia Nitrate area and is upstream of any waste/process water connections and will not require a construction permit. LSB has utilized seven frac tanks to increase the storage capacity of Ammonia Nitrate water to reduce the overflow into Pond 004 from rain events.

Maximize Treatment Efficiency and Capacity

Lake Lee Ammonia Stripper

LSB continues to operate the ammonia stripper with an approximate 20% efficiency. However, the stripper has to be shut down during freezing weather due to the lack of heat load on the stripper. Cold weather operation can/will cause freezing of the cooling tower.

Treatment of Pond 004

LSB met with Black & Veatch, a wastewater consulting firm, to determine the best treatment possibilities for Pond 004. Based on these initial conversations a biological system seems to be the best path forward. The B&V report was attached in the 13 Oct 2023 report.

Based on review of the Black and Veatch data, LSB is proceeding with biological treatment of 004, but we are still assessing how to address treatment barriers such as predilution, carbon addition, and sludge

generation. The design basis is complete. However, we do expect minor changes to occur as we move forward with this project.

The units are currently on site and are in a staging area. A construction permit will be submitted as soon as engineering is completed.

Black and Veatch is developing the processes to operate the plants and develop a written plan to use these package plants in the setup they are proposing. Once the plans are developed, we can propose permit modification to facilitate this. We are currently developing a list of longer lead time items (i.e. Transformers) to try to find alternative sources of procurement to prevent unforeseen delays. It was expected the transformer would be a potential long lead time element, with the design bases completed, we have sized transformers and this appears to no longer be the critical path. Ancillary equipment for these units is undergoing inspection and repaired as needed.

LSB internal engineering is evaluating siting and location for these package plants, this has been narrowed down to two locations. LSB contracted HSG to do site investigations for the foundation and to develop the foundation plans. We are waiting on the report from the ground penetration radar to select the site.

Additionally, we are evaluating possibilities of reuse of the process wastewater as an input into a product.

Increased Efficiency in Lake Killdeer Biological Activity

Based upon discussion with supplier of nitrification/denitrification bacteria, LSB will begin dosing Lake Killdeer with calcium carbonate or magnesium carbonate to increase the available of carbon and alkalinity in Lake Killdeer. Increasing available carbon should promote additional biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. LSB has also ordered one ton of lime and will begin dosing Lake Lee with the lime in efforts to increase alkalinity in Lake Lee which flows into Lake Killdeer. Before any dosing begins a construction permit will be submitted.

Baffles in Lake Killdeer

LSB selected a vendor to install baffles in Lake Killdeer. As discussed in our August 17th conference call, this should promote longer residence time and further increase biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. Baffles have arrived onsite. Construction drawings and design basis have been submitted to apply for the construction permit. The permit application was submitted on the 24th of January. The installation is expected to be completed in the first quarter of 2024 or as soon as approval is received from the ADEQ. ADEQ submitted the public notice on the 28th of February.

Water Quality Sampling Results

Water quality sampling required by the Interim Measures letter is included in the attached 2023 spreadsheet.

Water Column Profile Measurements

LSB has contracted with Alliance Technology Group (formerly GBMc) to complete the profile and sampling of Pond 004, Lake Lee, and Lake Killdeer. The field work was completed on September 28th.

KT French Drain

KT French Drain is located southwest of the KT plant on the west edge of the facility. Water is collected in a wet well then pumped back into the facility, much like a municipality utilized lift stations. During the previous inspection the pump was not operating and the wet well was overflowing. LSB has implemented daily inspections to ensure that the pump remains operational.

As requested, LSB collected samples from KT Wier. Samples collected on December 8th were collected based on the December 7, 2023 conversation with ADEQ and before we received the official request thus all requested in-situ parameters were not collected. Data is presented below:

Date	Temp	pH	D.O.	Cond.	Ammonia mg/l	Nitrate mg/l	Nitrite mg/l	Total – N mg/l	Nitrate + Nitrite
12-8-2023	NA	4.35	NA	79,150	6,600	10,351	0.43	16,951.4	10,351.4
12-12-2023	16	4.40	5.63	79,250	6,500	10,633	0.41	16,833.4	10,633.4
12-14-2023	18	4.37	5.16	77,440	6,350	10,669	0.46	17,019.46	10,669.46
12-19-2023	16	4.35	6.16	78630	12080	11,477	ND	23,557	11,477
12-21-2023	18	4.35	5.43	77,750	9200	11,108	ND	20,308	11,108

Other Actions

In this call LSB was informed we need to obtain a wastewater operator's license as quickly as possible. Charles McDowell is planning on completing the advanced industrial wastewater class in March. LSB currently has three certified operators. Second, ADEQ advised that LSB should coordinate with other Joint Pipeline members regarding discharges and volumes. We have initiated this communication.

LSB has contracted Alliance Technology to conduct a bathometric survey of 004. The results of the study indicate that Pond 004 contains approximately 1.5 Million Gallons of water.

Date	Lake Killdeer (KD)									Lake Lee							Pond 004								
	KD Grab Sample	KD Grab Sample	KD Composite EDCC LAB	KD Grab Sample	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	KD Composite EDCC LAB	LEE Grab Sample	LEE Grab Sample	Lee Composite EDCC LAB	LEE Grab Sample	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	Lee Composite EDCC LAB	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab	004 Grab
Time of Grab	Temp °C	pH	DO, ppm	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	P, ppm	SO ₄ ppm	Temp °C	Temp °C	pH	DO, ppm	NH _{3-N} , ppm	NO _{3-N} , ppm	Phosphorous, ppm	SO ₄ ppm	DATE/ TIME	Temp °C	DO, ppm	pH	Conductivity	NH _{3-N} , ppm	NO _{3-N} , ppm	SO ₄ ppm	
6/21/2023				6.60	1688	115	131	138			7.31		141	153		201									
6/22/2023											6.86		123	130		322									
6/23/2023				6.68	1705	115	133				7.17		101	116		287									
6/24/2023											6.84		78	94		200									
6/25/2023											7.14		55	69		199									
6/26/2023				6.69	1690	119	130	1.32	143		6.72		49	54	1.27	184									
6/27/2023											7.02		125	136		180									
6/28/2023				6.75	1672	122	127		142		7.61		195	201		143									
6/29/2023											7.82		192	194		146									
6/30/2023				6.64	1720	119	133		141		7.97		132	164		167									
7/1/2023											7.59		108	126		167									
7/2/2023											7.23		75	100		167									
7/3/2023				6.69	1730	120	137	1.38	144		7.09		72	86	2.21	149									
7/4/2023											7.06		51	67		158									
7/5/2023				6.77	1724	125	133		142		6.82		102	116		152									
7/6/2023											6.96		188	209		172									
7/7/2023				6.74	1720	116	132		140		7.62		186	223		161									
7/8/2023											7.66		134	130		186									
7/9/2023											8.21		132	126		195									
7/10/2023				6.75	1780	130	136	5.24	140		8.16		209	231	3.83	155									
7/11/2023											7.88		157	196		125									
7/12/2023				6.64	1782	102	113		139		5.74		52	66		73									
7/13/2023											8.49		136	215		75									
7/14/2023				7.50	2240	179	69		34		8.22		281	119		36	07/14/23			9.02	24910	4320	2989	2	
7/15/2023											8.29		278	323		109									
7/16/2023											8.50		231	270		110									
7/17/2023				6.98	1890	151	153	6.08	112		8.35		222	229	4.11	124									
7/18/2023											8.03		167	189		122									
7/19/2023				6.95	1820	143	143		104		7.92		133	143		110									
7/20/2023											8.17		128	137		170									
7/21/2023				6.91	1804	140	141		108		8.05		120	129		123									
7/22/2023											7.49		95	93		113									
7/23/2023											6.86		86	82		121									
7/24/2023				6.90	1763	125	136	2.03	110		7.69		86	90	2.89	133									
7/25/2023											7.38		72	79		146									
7/26/2023				6.85	1764	126	134		110		7.22		58	72		125									
7/27/2023											7.43		53	57		101									
7/28/2023				6.84	1753	120	132		110		8.14		36	42		121									
7/29/2023											8.27		16	30		107									
7/30/2023											6.99		10	24		121									
7/31/2023				6.83	1745	128	129	1.96	110		7.19		13	20	1.34	119									
8/1/2023											6.92		64	75		126									
8/2/2023				6.77	1726	114	128		111		7.09		38	51		122									
8/3/2023											8.10		16	32		113									
8/4/2023				6.79	1710	119	126		111		7.44		9	22		143									
8/5/2023	8:53AM	28	6.79	7.65	1703	114	125			6:00AM	26	6.60	6.03	6	17	1.22	147	11:20am	34	10.63	7.14	48920	5280	6293	25
8/6/2023	9:57AM	29	6.77	8.27	1676	105	123			6:00AM	25	6.45	6.12	6	15	125	147	9:50AM	28	5.61	7.07	49230	6200	6191	34
8/7/2023	8:25AM	26	6.80	6.45	1683	115	124	1.75	113	7:00AM	27	6.48	7.69	7	14	115	125	10:09AM	27	6.02	6.95	49870	6200	6657	20
8/8/2023	8:45AM	26	6.84	6.13	1678	114	124			7:00AM	26	6.81	6.08	10	18	111	115	8:40AM	30	6.5	6.84	49750	6240	6216	33
8/9/2023	8:13AM	27	7.11	7.34	1584	114	120			7:00AM	24	7.26	7.86	102	102	80	111	8:53AM	25	5.62	6.81	34560	4260	4281	22
																		8:39AM	25	6.63	6.63	29930	3660	3553	18